

From the system builders.  
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# Argus700 Series 2.

FERRANTI  
Computer Systems

## NEWS IN BRIEF

### ICL develops bank terminal

FOLLOWING its success with Barclays Bank, which has placed a "pilot order" for 1,000 computer terminals, ICL has confirmed that it has a complete financial terminal system under development. It will include terminal equipment built by Portronic of Fife, the firm that will build the units sold by ICL to Barclays. See ICL/Portronic Euro deal, page 7.

### Travel to Compec

SPECIAL travel and accommodation arrangements are being organised by IPC Electrical-Electronic Press for visitors to the Compec Europe Exhibition in Brussels from May 5-7. Accommodation has been reserved at the Sheraton Hotel in Rogier Place, opposite the fair grounds. Further information can be obtained from Commercial Trade Travel, Carlisle House, 8 Southampton Row, London WC1 (tel: 01-405 5469).

### Ada committee

REPRESENTATIVES of the companies within GEC-Marconi Electronics dealing in military computer programming have formed an Ada Co-ordinating Committee which is to co-ordinate the group's activities in this field to supervise an internal study of the requirements of Ada, and provide a point of contact for other interested organisations.

### 'End monopoly'

OVER 140 Tory MPs have joined together to call for an end to British Telecom's monopoly on the maintenance of equipment attached to the telephone network, along with the de-monopolisation of supply by the British Telecommunications Bill.

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# High-tech firms share know-how

by Eileen Stainer

EUROPEAN and American electronics and computer companies have set up a consortium for the sharing of new technology. The project is similar to the nine company VLSI venture in Japan which is run by MITI, the Ministry of International Trade and Industry.

Operating under the name of Stack with its headquarters in Woking, the consortium is an organisation of manufacturers in organised electronic equipment. Its objective is to enhance large-scale integrated (LSI) and VLSI circuit development outside Japan by sharing information. Other bases are thought to exist in Germany and Italy.

Companies participating in Stack each have one or two representatives who attend regular discussion meetings. According to the GEC representative, John Whitelegg of the Hirst Research Centre, who returned from the latest meeting early this week, the meetings are reminiscent of a users' club.

Problems that each company experiences in the development of certain advanced LSI components like memories and microprocessors are discussed at the meetings, and each participating company benefits from the others' experience.

According to another spokesman, Stack sets a target achievement which is not likely to

be reached for many years to encourage companies to share their knowledge and to work harder trying to achieve the aim. One past aim was the 64K dynamic RAM.

Now, Stack is concentrating on further development of uncommitted logic arrays, an area which interests both GEC and Racal, two of its participating companies. Other companies participating are thought to be Nixdorf, Siemens, ICL, Control Data, Plessey and British Telecom. GEC joined Stack last September.

Members of Stack are said to pay an annual subscription, although no one from Stack would confirm this. The organisation is run by John Hayden, who is managing director, and John James, technical director.

## TSI broadens its base and moves away from IBM

AS part of its strategy to become one of the top three software products houses in the world by 1983, TSI - the software products division of Dun & Bradstreet - has taken over Programme Products Inc and is to make more of the packages available for non-IBM kit.

The deal, worth over £1 million, adds three products to the TSI stable. These are Data Analyst, which has over 500 users worldwide and allows users to create and submit part requests via an online video terminal; Audit Analyst, which allows DP auditors to retrieve data they want to examine; and Project Monitor which is a user-friendly project control system that can gather and report progress to as many as eight hierarchical levels within a company.

TSI's European general manager, Mark Bennett, said the reason PPI had been taken over was that it had the best "fit" into its existing product line of TaskMaster, KeyMaster, KICS/MM, DocuMaster and Owl. The existing PPI distributors are to be dropped.

Dun & Bradstreet's strategy was



BENNETT... feels no firm can continue to rely exclusively on the IBM market.

to expand in Europe and to have a more aggressive sales objective, said Bennett. TSI has a target of £1.5 million revenue for the 1981 financial year. The figure for the previous period was £800,000. To achieve its target to become one of

the top three, TSI is aiming at a worldwide turnover of £25 million by 1983.

Bennett added that had TSI's bid been unsuccessful, it would have pursued bids for other similar firms. PPI was originally owned by Information Sciences.

He said TSI was a market research oriented firm and that it had the next three years mapped out. It hoped to acquire a US applications firm as well this year.

TSI is also expanding its operations in Europe with the opening of a Scandinavian sales office in the summer and a software factory at Dublin which will create over 50 new jobs. TSI expects to produce all its new software there for worldwide distribution.

Bennett said that originally TSI was heavily IBM oriented, but now no firm could continue to rely on this market exclusively. He said that whatever happened to plug compatible manufacturers such as Amdeh or Magnum, IBM appeared to be trying to get control back via the 4300 line.

TSI also hoped to make more of its products available for the popular makes of minicomputers and non-IBM mainframes.

## Network trials nearing end

by Donald Konnett

LONDON-BASED local networking company Xionics plans to complete the first six trial installations of its Xnet office automation networking system by the end of March.

Development of the system began when Mike Bevan set up the company at the end of 1978 and has largely been funded by advances from these first six customers, following a Department of Industry Microprocessor Application Project grant for the initial work.

Since then Xionics has grown to a 24-man company and the latest injection of capital has come from Meritor Investments, a subsidiary of Midland Bank and Rolls-Royce Pension Trust. It totals £250,000 and includes the purchase of a 25% stake from a minority shareholder.

Xnet is designed to provide reliable access to a variety of resources via multi-function terminals spread throughout an organisation. All the elements of the system are duplicated, from the power supply and the cable up.

## Loyalty of IBM users

by Kevin Cahill

A SURVEY of communications in Western Europe has revealed marked differences in the expected loyalty of IBM and ICL users when they come to replace the CPUs at the heart of their distributed processing networks.

The survey shows that of ICL users which responded and are planning a change of CPU within the next 48 months, some 41% intend to stay loyal, with 47% undecided. This compares with 79% of IBM users intending to change systems but remain with IBM.

Other aspects of the report said that the communications equipment and services market in Western Europe grew by 36% in 1980 to total £1,453 million, with £120 million of it spent on external communications.

The fastest area for growth in small business systems and minicomputers, up 45% on last year and predicted by the survey to keep on growing over the next five years.

European Communications Survey in Western Europe, IDC Europe, Bank Road, London W4 1AL, pp. £1.250.

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## Xerox profit margins slip

DESPITE a 10% increase in profit for 1980, to \$619.2 million in turnover of \$8.2 billion, profit margins at Xerox Corp slipped from 18.3% to 16.5%.

The copier and word processor manufacturer also revealed one of its finance subsidiaries will be borrowing up to \$160 million to help the parent Xerox Corp in a new customer installation. The latter also expects to go out to its first domestic financing in 1974. This will be for a \$200 million to replace existing loans which mature during 1981.

The slip in profit margins was attributed to a shortage of new copier products and difficulties with the 3300 copier technology. Sales of the company's processors, which rival IBM's particularly in the US, were on a

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# Computer Weekly hits 100,000 circulation

100,000 copies circulated each week and substantial extra investment is the recession-breaking news from today's Computer Weekly.

We have become the first British computer publication to breach the six-figure circulation barrier and can now announce added investment in people and resources.

Both are designed to stretch our lead at the head of the market, a position established when Computer Weekly was launched

as Britain's first computer newspaper in 1966.

This week also sees the introduction of our new title, together with a consolidation of design improvements introduced over the past few months. A change in the order of pages and new typefaces for headlines are included.

From this issue, all general news pages, together with the specialist Software File, Micro News and Company News, are grouped at the beginning of the paper.

They are followed by a spread of comment pages including the leader, readers' letters and the Downtime column, plus Don's Inimitable Liveware File cartoon strip.

Then come more relaxed features on the working lives of programmers and operators in Programmers Page and Op Spot respectively, followed by the People page to keep you up to date with who's on the move.

Special features, including the successful current series on Data

Analysis, round off the main body of the editorial.

But don't forget to look for the Sales Bit at the back of the paper: if you're concerned with selling, Alen Williams provides an excellent reminder of the basics of life. He will be new to many recent readers, including those just added to our circulation list, some of whom have been waiting for several months.

In fact, there are now more people receiving Computer Weekly in each of the major job

categories - from directors through to operators - than any other journal. Extra sales executives have joined the team to meet the demands of advertisers.

The whole investment package marks our determination to keep growing to match growth in the industry and to continue providing the best possible news service and advertising platform for the largest possible number of readers.

Have a recession-breaking year.

## First fruits of DP support programme

# EEC aid backs Britain

by Donald Konnett

THE first round of awards under the EEC's long-awaited data processing support programme have brought backing to a joint Danish/British fund will go to Regnecentralen in Denmark and SIA Ganymede in the UK to develop universal communications terminal software for open networking.

The National Computing Centre revealed last week it is also receiving support for collaborative studies on privacy, security and programming methods.

Project proposals were invited in February last year for submission by June and selection by the end of the year in this first round of awards, and a similar schedule is expected to start this month for the second round.

The first usable products from Regnecentralen and SIA are expected to emerge in 18 months in the form of portable real time Pascal programs.

Designed to enable a terminal to attach to local or public networks, the software will use the Transport Service protocol defined by the European Computer Manufacturers' Association to fit into the international Standards Organisation's seven-layer architecture for Open Systems Interconnection.

Other high level protocols will be chosen to minimise later work when standards are fixed.

Regnecentralen and SIA Ganymede previously worked together on communications systems for the European Centre for Medium-Range Weather Forecasts.

Funding, a loan of 500,000 European Units of Account (£280,000) designed to cover half the development costs, falls under that section of the EEC programme which aims to help companies bring worthwhile competitive products of their choice to the market. The awards are made in

● Turn to page 5



Software copyright expert and counsel Alastair Kelman advised SCT "not to take on the world."

## ACT backs down on software injunction

by Keith Jones

HOPING to avoid the expense of being the UK's software copyright case law pioneer, ACT Microsoft has decided not to apply for an injunction against David Bolton, the private individual who sells VisiCalc Backup. This is the floppy disc-based product that enables Apple users to make one copy of the business planning package, VisiCalc.

ACT sells VisiCalc in the UK on behalf of Personal Software of Sunnyvale, California, and stated its intention at the turn of the year to apply for an injunction stopping Bolton from selling his Backup product.

The decision was taken after ACT's counsel, software copyright specialist Alastair Kelman, found that Bolton was selling VisiCalc Backup on a wholesale basis through the Lion House microcomputer stores as well as selling it directly to end users.

According to ACT, Bolton has now given undertakings that he will keep full accounts of all his sales of VisiCalc Backup, including wholesale shipments, so that ACT's losses can be assessed accurately when the case eventually comes to full trial. Normally a customer must pay ACT the full £125

price of VisiCalc if he wants a second copy while Bolton's Backup product will cost him less than £20 at Lion House.

ACT believes that it could now take two or three years for a full trial to come to the courts, and hopes that by then similar cases will already have been heard, providing a precedent.

An ACT spokesman commented: "ACT has a duty to its shareholders not to take on the world. There is no need for ACT to suffer because of a lack of legislation."

Clare Gooding adds: "Last week it was revealed that the EEC is gathering evidence of software piracy and problems in software protection to 'discover whether the need for legislation is as urgent as it appears elsewhere'."

The move follows the submission to the Directorate last September of a discussion paper from the European Computer Services Association, which is backed by Barney Gibbens of CAP and Philip Levis of GEC.

The paper backs the view of Alastair Kelman that the word "infringement" would provide a much-needed definition of the ownership of machine-processed information.

"Alastair's solution is an elegant one," said Gibbens. "It actually goes further than the recent US legislation."

## NEWS BRIEF

### Pet boss for Switzerland

KIT Spencer, head of Commodore UK, is leaving the company to take over the ailing Commodore Electronics (CEL) in Basle, Switzerland, which runs the marketing side of Commodore's business worldwide.

The move comes at a bad time for the company, as it prepares for the launch of its new personal computer, the VIC20, in the UK. Bob Gleadlow, who previously headed the watches and calculators side of the business, is to take Spencer's place.

### Another job

BOC Computer Services has acquired a 100% shareholding in Amersham-based H Programming and Systems (HPSL). Negotiations over the acquisition of the contract programming organisation have been going on for the past nine months.

HPSL joins a contract and permanent recruiting stable at BOC which already includes Knight's and Datasolve International.

### NEC ups output

NIFFON Electric will step up its production of 64K dynamic RAMs from 40,000 pieces a month to 100,000 a month from April. Three versions will be available, with access times of 150, 200 and 250 nanoseconds.

### WP for Minister

THE Department of Industry's plans to automate its offices have taken a small first step with the acquisition of eight Nexos 2200 screen word processors. One is going into the private office of Information Technology Minister Kenneth Baker, and the rest are for use in typing pools where they are replacing automatic typewriters.

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# CAP directors deny job security pledge

by Claire Gooding

SEVENTY people at software house CAP are to lose their jobs, despite the belief of many after the December 1 annual general meeting that there would be no more redundancies after the loss of the mainframe products arm CPP.

Group operations director Mike Smith denied that there was any promise at the annual meeting about the safety of jobs. "Any management would be mad to make such a black and white statement," he told Computer Weekly.

But it is clear that many employees got the impression from the mood of the meeting that their jobs were safe, although some administrative cuts were inevitable. Smith has now circulated a memo to CAP staff, saying that he is confident there will be no more redundancies.

"People think things were said that in fact weren't," explained personnel director Graham Elliott. "They were looking for reassurance, and some came away with the wrong impression."

"No-one's happy about the redundancies but there seems to be a reasonable level of understanding. We're doing all we can to help, and have placed three people within four days."

In a statement last week Smith blamed the sale of CPP and the recent demerger of Alex d'Agapeyeff's Microproducts division (in which CAP wrote off £2.5 million) for the staff cuts, explaining the move as a "rationalisation of the structure of the group."

But further cuts in the company's staff levels (CAP dismissed its graduate intake last year as well as losing the CPP staff) indicate that the trouble at CAP goes deeper than the directors are prepared to admit.

Smith's statement admits that the recession has put pressure on the company, while implying that top-heavy administration is the main reason for the cuts.

In fact, CAP's traditional markets of large DP projects and "bodyshopping" of Cobol programmers have shrunk while its substantial outlay on ventures such as Microproducts and CPP's improve have failed to show a return. Of the 69 people losing their jobs nearly 50 are programmers.

"It's a matter of genuine over-capacity," said Smith.

The company now has 850 staff. Although CAP retains its reputation for quality work, the company is not helped by persistent City rumours that CAP has been rebuffing offers from its one-time European associate Cap-Gemini-Sogefi on the grounds that the price is too low.

Chairman Barney Gibbens, describing the cuts as "sad but necessary," remains optimistic about CAP's future.

"We'll come out of this lean, fit and hungry, and able to do the business we do the best."



Chairman Gibbens... cuts are "sad but necessary."

## New database machine for launch this year

by Rory Johnston

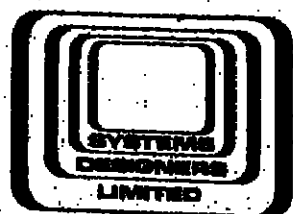
A DATABASE computer of novel design that is intended to handle large volumes of data for transaction processing is being developed by a small company in Los Angeles.

Started by a former Xerox researcher, Teradata intends to launch its secret product, comprising original hardware and software, in about six months, to provide extended database management facilities at low cost.

Teradata's founder, Jack Shemer, was involved in informa-

tion retrieval research when head of Xerox's Advanced Development Lab in Los Angeles. His product is intended for use either as a back-end processor on a mainframe or on its own, and can be used in either a large or small configuration. It will handle the management of data, sorting, security, recovery, and transformation of data.

Shemer has 22 employees now, called from Xerox, Honeywell, California Institute of Technology, and Transaction Technology, where Shemer himself once worked.



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## Intel files employee piracy suit

by Eileen Staines

FIVE former Intel employees are being charged with planning to use Intel trade secrets and confidential business information. It is claimed that they planned to produce and sell the company's 64K BEPROM, which is not yet on the market.

The former employees left Intel's special products division to form a company under the name of Seeg Inc. Intel has filed suit against Seeg in the Santa Clara County Superior Court in California, alleging that the four were among the few individuals who had access to secrets surrounding the development of the 2864 BEPROM chip.

● In Santa Clara recently two men have been charged with selling 10,000 defective Intel memory chips which had been stolen in 1979 after Intel's quality control rejected them.

## Micro move

ITALIAN computer company Olivetti is negotiating to acquire a minority share in US microsystems company Itasca InterSystems. The deal is expected to be completed next week. The move is seen as a bid by Olivetti to get a foothold in the microcomputer market.

## Three more H-series processors soon

by Keith Jones

THIS year could mark the addition of three more IBM processors to the H-series, which began late last year with the 10 million instructions per second 3081. One will be more powerful than the 3081 and the other two will fit in below the first H-series machine.

These are some of the main predictions made in a report published by Strategic Business Services of San Jose, California, which looks at IBM's large and mid-range system strategies.

The report examines aspects of the 3081, their impact on existing 303X plug compatible competitor machines and on IBM's.

It discusses how the "dyadic" processor in the 3081 functions and examines costs of 3081 software which include nearly \$3,000 in the US for the most basic maintenance and \$7,500 a month for typical licence fees on unbundled software.

SBS sees June as the likely launch time for the H-4, code-named Spruce, with a 14.5 mips dyadic processor, and for first shipments in the second quarter of 1982.

June will also see the introduction of H-2, an eight mips unit (code-named Maple).

IBM will be ready to announce

the H-1, code-named Poplar, in September; it will be a slowed-down H-2, and field upgradable to the latter machine.

The report also looks at the impact of the 4300 series on the plug compatible suppliers operating in the mid range, concluding that they are in great difficulties generally.

National Advanced Systems' mid-range machines are described as "badly out of alignment" with 4300 price/performance while Magnuson is considered to have "enormous and continuing" cash requirements, even though it appears to be doing well by concentrating on end-user business in the 370/148 class and above.

Nixdorf is the only plug compatible manufacturer that seems to have recognised the threat introduced by IBM's new software and support strategies, according to the report.

SBS refers to Nixdorf's purchase of the Computer Software Company with its EDOS/VSE system, an alternative to IBM's DOS/VSE.

● IBM's Large and Midrange Systems: Latest Trends and New Strategies. 320 pp. \$950. Strategic Business Services Inc. 4320 Stevens Creek Blvd., Suite 215, San Jose, California 95129, USA. Tel: 0101/408/243/4121.

## WP book aims to raise standards

by Rory Johnston

UNETHICAL word processing methods, needless distress and time caused by ignorance are problems that have grown to set up the Institute of Processing.

They have opened an office and aim to get qualification for members, genuine training and information in order, in the Institute of the word processing profession.

The five founding members, especially well-known to the DP world, include Ron Thornton, Nick de la Unlesse, and Electronics and H&E typing supervisor at B&H. Membership will be open to all who are involved in word processing and who hope to obtain benefit from a foundation.

Mrs Granger is joint secretary and liaison officer. She is the Institute's first treasurer. The high-profile salesmanship of word processing has been combined with what they really need.

There is also the operators being employed having enough time to work and doing the work.

"Girls have been taken," Mrs Granger says. She hopes the Institute will be able to establish a library of information for prospective buyers through existing products, and legal department.

The Institute has to work with the established Word Processing Association, the BCS WP special group. Some scepticism has been expressed by other word processing bodies over the Institute's success. Mike Handley of the Assurance Agency BCS group, said he was not sure what it would achieve, but he would support it, and he understood its intentions.

Mrs Granger said that the Institute was in the idea of word processing, and she would support it, and she understood its intentions.

The Institute's first

Rory Johnston and Donald Kennett look at some of the latest developments on show at Info 81.

## Giving new Status to homegrown information retrieval technology

A POWERFUL new means of retrieving information could become widely available using a link between two established retrieval products.

British software retrieval package Status was shown at the Info 81 Exhibition controlling an Image Systems automatic microfiche terminal in a system, already under order for UK research establishments, that should soon be put on the commercial market.

Image Systems demonstrated its terminal, holding 780 fiches in a computer-controlled carousel, connected by dial-up link to a Prime mainframe running Status, the retrieval program developed at Harwell laboratories.

Text retrieved from Status contained frame numbers which drove the microfiche terminal automatically to display a corresponding picture, which could comprise more text, graphics, or even a photograph.

The combined system was de-

veloped at the British Non-Ferrous Metals Technical Centre, which may become the marketing organisation. Seven systems are planned already for installation at British Nuclear Fuels to retrieve scientific information.

Image Systems already markets a newspaper cuttings retrieval system employing a local Univac mini. One was installed at the Daily Mirror two years ago but has lain unused because of union disagreement; it is expected to go live on March 1.

Prominent among the few new word processing products to be seen at Info 81 were several different models of conversion kits to turn golfball typewriters into cheap WP input stations.

Since there are similar devices announced recently to convert typewriters into printers, users must wonder why these roundabout methods should be preferred to pure electronic typewriters, but it is felt that as there are so many

golfballs in the field already the conversion kit market is large.

Formscan was showing its Chatterbox unit for the first time. It can write mini floppy discs for a wide range of word processors, instead of handing only one, unlike those supplied by individual WP companies.

A set of microswitches is inserted in the typewriter and a floppy disc drive sits alongside, all for £1,650. Different firmware is provided to suit the word processor's formatting and tab conventions.

Datavord showed its established conversion products, together with one from the Dutch firm Transaction Word Systems that is not yet on the market and uses twin tape cassettes.

The shared-resource version of the successful US word processor NBI, known as OASys, was on the Venetian stand.

This comes in two basic versions, with 10 megabytes or 70

megabytes of hard disc and up to six screens on the smaller and 32 on the larger. The screens and operating facilities are the same as on the standalone version.

IBM's new 75 electronic typewriter made its debut. This has either 7,500 or 15,500 characters of RAM, which can hold several whole documents as well as standard phrases.

Also attracting plenty of interest was the Displaywriter 'low-cost word processor, with its enhanced software providing mathematical functions, global replacement, document merge and form filling. With additional facilities such as column manipulation, this new software is making the Displaywriter look like a complete replacement for the Office System 6.

Now operating under the banner of Exxon Office Systems, Vdec demonstrated a communications link between its screen machines and Qyx electronic typewriters.



IBM's latest electronic typewriter, the 75, can have 15,500 characters of storage, albeit volatile, and boasts illuminated operator messages.

## CMG moves into viewdata bureau

VIEWDATA has been chosen as the first in a series of piecemeal additions to Computer Management Group's bureau operation designed to lead eventually to integrated electronic office services.

Bob Fawcett, one of CMG's two founders, said at Info 81 that the viewdata bureau service would begin in July using a Redifon R800/70 running Redifon's Viewdata Plus software.

It would aim at potential users of the Prestel, Bildschirmtext and Viditel public viewdata services in the UK, West Germany and Holland respectively, where CMG markets bureau services based on Burroughs B3800s in Croydon and Amsterdam.

The service was on offer at £5,000 a year for one access port, 750 pages and unlimited time on the machine, with the aim of giving potential public service information providers the opportunity to experiment and prepare a database and allowing potential in-house or closed-user-group users to begin modestly.

These terms would be reviewed

at the end of March in the light of response.

Six potential customers had been lined up, including a stockbroker, a bank, a retail chain and a motor manufacturer. Two likely users were management information retrieval and dealer network servicing.

Dealers might consult a product catalogue on the public service and then transfer to CMG's bureau to place an order and see it confirmed.

Office diary, mailbox, newsletter and sales-prospect follow-up reminder are other applications. The viewdata service could be the interface to conventional data processing, either on the R800 or via a gateway to the B3800 mainframes or to other external services, public or private, later this year.

The Hewlett-Packard HP3000s which have been installed as front-ends to the Burroughs machines will be used increasingly to carry out the protocol conversions necessary for these kinds of flexible interconnection arrangements.

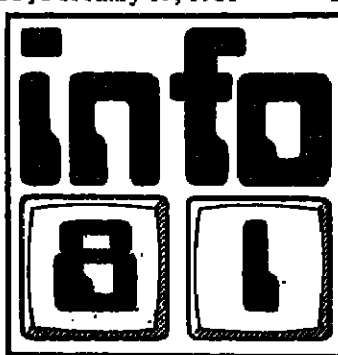


In a break from addressing the Info 81 conference, Rory Johnston, deputy principal secretary at the DoI (centre), and Sir John Barran, head of Viewdata at the General Office of Information, were shown Case's scheme for local and wide area networks by Christine Slat.

## Case backs Ethernet

CASE has planted its flag firmly in the Ethernet camp in the battle of standards for local area networks, with the decision to develop a unified data communications scheme called Casenet. The UK firm will be adding a local network to its product range based on the Ethernet specification for a broad-based, present, using coaxial cable, agreed by Xerox, Intel and Digital Equipment.

Case is also planning a transport service providing route selection, access control, and speed, code and protocol conversion. Network control arrangements will cover usage monitoring, fault isolation, and centralised diagnosis. Interfaces are to be implemented to the Case MSX store-and-forward select message switch and the Case Viditel electronic mail terminal. Applications software planned includes mailbox and office diary services.



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Info 81



# LCN BSN

...these stand for the computer system of the future.

Two newly defined and rapidly developing forms of computer technology are emerging:-

## LOCAL COMPUTER NETWORKS (LCN) BACK-END STORAGE NETWORKS (BSN)

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The NESTAR CLUSTER/ONE MODEL is a practical, cost effective implementation of an LCN, using proven hardware. Apple microcomputers and dual floppy disks or Winchester disks for the BSN.

A number of these systems have already been in operation for one year.

Zynar is the European business partner of Nestar Systems Inc.

Zynar Limited, 122/3 High Street,  
Uxbridge, Middlesex UB8 3PH

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**ZYNAR**  
SYSTEMS TECHNOLOGY & COMPUTER SERVICES

## Adler aims to sell 2,500 micros in UK this year

by Brandon Gamester  
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by Donald Kennett

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by Chris Hipwell

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From front page

Two HBS's Putney offices, firing the 15 members of staff, Tony Cooke, resurfaced, closer to the centre of London with a firm called Hallmark Computers, first registered in mid-1979 as a holding company. Hallmark Computers was Cooke and Watnwright as its directors.

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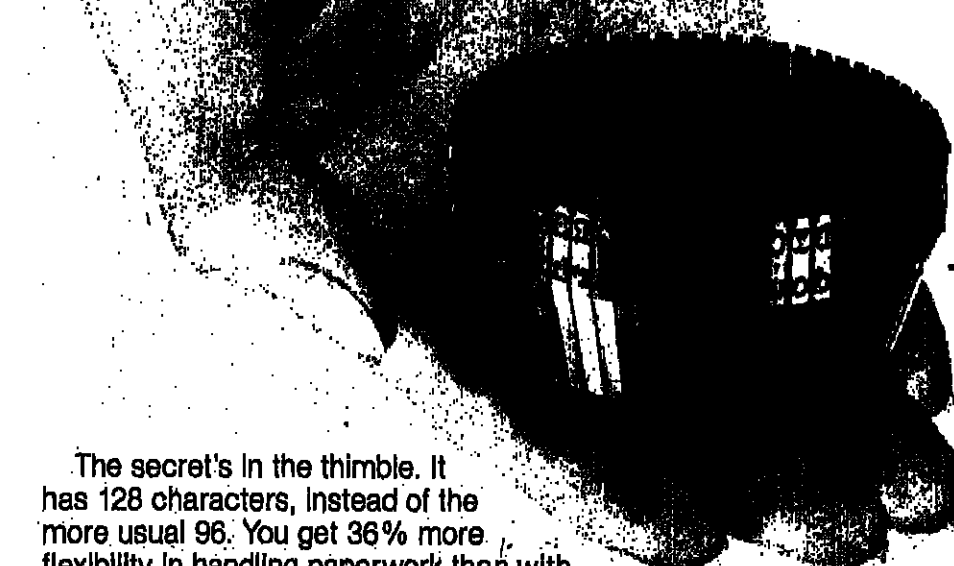
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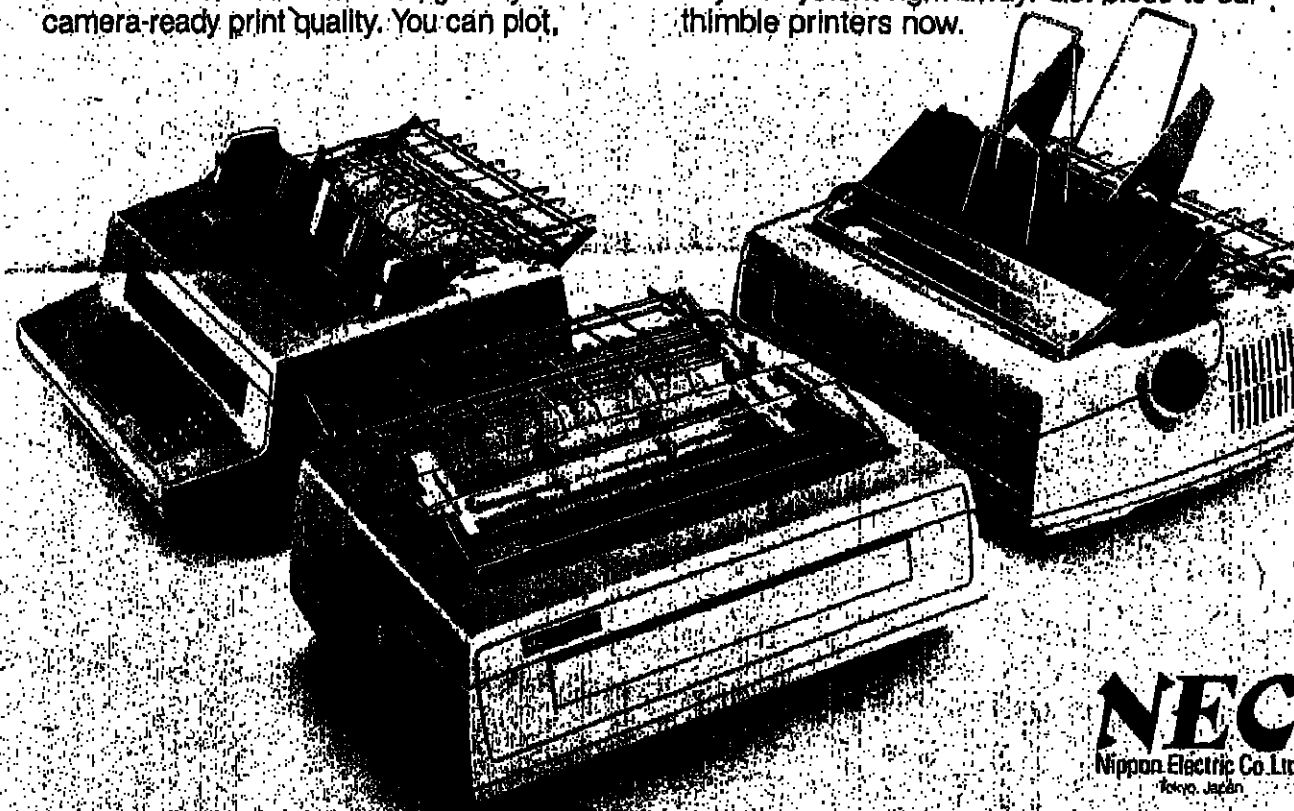


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And that's just for openers. Thanks to our own LSI and microprocessor technology, the NEC Spinwriter Series 5500, which comes in three models, gives you camera-ready print quality. You can plot,

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For more information, please contact:  
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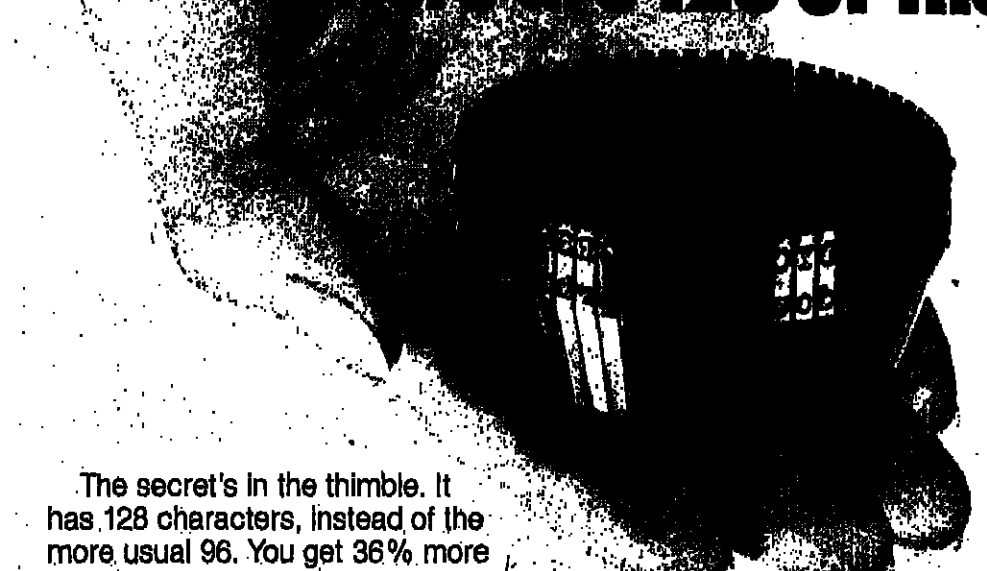
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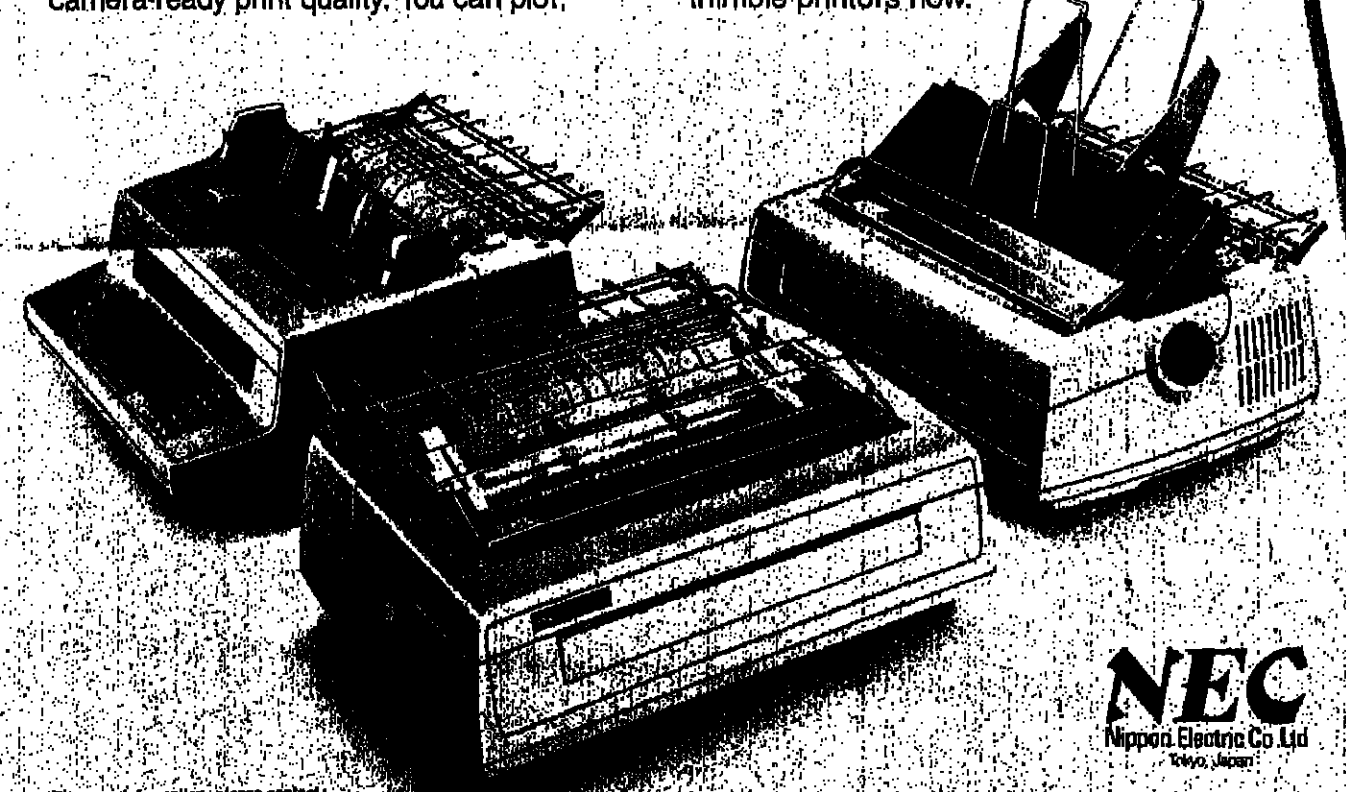


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**NEC**  
Nippon Electric Co Ltd  
Tokyo, Japan

For more information, please contact:  
NEC Telecommunications Europe Co., Ltd., NEC House, 150 Tottenham Court Road, London W1P 0LP UK. Tel: 01-386 6500 Telex: 251314  
Shima Systems Ltd, Thistle Park Industrial Estate, Thistle Park, Glasgow G3 7BB. Tel: Thistle (044 421) 5471  
NEC Systems Ltd, 100, The Quadrant, London W1 0LP. Tel: 01-386 6500 Telex: 251314



# Computers thriving in the Irish climate

ABOUT 2,000 jobs were created in the Republic of Ireland's computer industry last year by the Irish Development Authority, the single body charged with the expansion of the country's industrial base.

They form a significant contribution towards the 35,600 jobs created in all sectors, including about 3,000 in branches of electronics other than computing. According to the IDA, the country now has an industrial investment rate second only to that of Japan and Japanese companies are currently heading the growth of Ireland's computer industry.

The biggest computer project finalised last year - one of the

largest by a Japanese company in the whole of Western Europe - was the £40 million integrated circuit plant in Tallagh, County Dublin which should create 1,000 jobs.

Other companies to set up during 1980 were Beehive, Dansk EDB, Regnecentrum, Apple Computer, Sord and National CSS.

According to a US Commerce Department survey, the return on investment of computer hardware and software companies in Ireland is now 29 per cent, largely because of low taxes and high grants for starting up there.

At the end of last year, the latest benefit for new investors came with a uniform 10 per cent cor-

poration tax level which applies until the end of the century.

An IDA spokesman went to some lengths last week to explain that the country is not a low wage economy, although its employment costs are well below the rest of Europe and Japan.

The cost of keeping an executive in Frankfurt for a year is set at £51,000, for instance, £57,000 in Paris and £36,000 in London. His or her cost in Dublin is set at £25,000 per year.

Ireland also has the lowest hourly unit labour costs. In unit measure, Belgium comes out with 100, the US with 64, Japan 47, but Ireland with 41.

## French electronic phone books

by Jack Gee

FRANCE'S directorate-general for telecommunications is about to place orders for 250,000 "electronic telephone directory" terminals in readiness for the launching of a pilot scheme in Brittany later this year.

The DGT has chosen Thomson-CSF in partnership with Saint-Gobain-Pont-a-Mousson and Telic, whose partner is Matra.

The French government has opted for this formula of partnerships in order to enhance the market impact of the terminals by linking sales to major existing distribution networks.

The entry of Saint-Gobain appears to be associated with its recently announced tie-up with Italy's Olivetti, which has a sales network well adapted to interna-

tional sales of the electronic phone books.

Philips' French subsidiary TRT-RTC, which shared a pre-production order of 1,000 terminals in 1979 with Thomson-CSF, Matra and Telic, is consequently absent from the new line-up. The Dutch firm has apparently been considered by the directorate-general as lacking enthusiasm for the French Videotex venture.



## Sir Keith's 'blessing'

by Rory Johnston

INDUSTRY Secretary Sir Keith Jones was in Winchester last week to open Office Technology's new development labs and give his ministerial blessing to a DoI-supported advanced office automation project that looks like giving the NEB's Nexos a good run for its money.

OTL has DoI backing of £635,000 as well as another £2 million of funding from its sister company Computer Technology, and aims to launch the first model of its

office system, limited to word processing, by the end of the year. The company aims to provide "principal support" that is, automation for managers, professionals, administrative staff, and other originators of documents rather than for typists.

The firm plans to open a purpose-built HQ building in Winchester early next year.

● Sir Keith is pictured opening the OTL facilities in Winchester touched by managing director Spud Taylor.

## Minister in talks Japanese link-up

by Keith Jones  
MINISTER of Information, Technology, and Industry, Kenneth Baker, calls "an initial visit" in April to discuss possible co-operation with Japanese companies and organisations.

Reports suggesting a would centre on the use of fifth generation computers described as "greatly inspired" by Roy Atkinson, head of the Department of Industry Technology Division. Atkinson said UK companies were aware of the Japanese fifth generation computer project.

The Japanese Ministry of Industry, MITI, is an international effort to create a computer, one of a number of projects available from the Japanese government. The body set up to do the research is the Fifth Generation Computer Survey and Research Group, which will receive only a small amount of government money.

## NEWS BRIEF

### Jobs for disabled

DISABLED people in the UK are being encouraged into microelectronics in an attempt to overcome future shortages of skilled personnel. A working party has been set up by companies which have joined the Muscular Dystrophy Group of Great Britain to investigate the problems and publish guidelines both for the disabled and the industry.

### Police system

IBM and the Irish government have signed a £200,000 leasing agreement to supply the Irish police service with a 4300 computer system which will store information on stolen and suspect vehicles, firearms licences, missing persons and vehicle registration as its first task.

### Postcoding

AT LEAST 70% of all mail must be postcoded if the computerised sorting system is to pay its way, a Post Office spokesman has admitted, after Midlands householders noticed some of their mail arriving with blue-dotted envelopes. The Post Office has used an invisible mail code for some time, but management decided to incorporate a visible reminder. Only 49 per cent of the UK mail is postcoded at present.

### DEC services

MARKETING, planning and support services for Digital Equipment's 36-bit time sharing machines, the DECsystem 10 and 20, will be provided in future by a new large computer group which will assume functions handled formerly by the various market-oriented groups within DEC.

### Schools discount

SCHOOLS and colleges are offered discounts of about 25% on Onyx C8000 series micros from Thame Systems of Thame in Oxfordshire, until the end of March. Made by Onyx in San Jose, California, the range starts at £6,500 for a system based on a Zilog Z80A eight-bit processor with a 10-megabyte Winchester disk drive and block-reading cartridge tape back-up.

### Japanese imports

IMPORTS of Japanese office and computer equipment accounted for £74 million of the £1,113 million total of goods imported from Japan by the UK in the first 11 months of 1980. The figures from the Anglo-Japanese Economic Institute show that road vehicles still accounted for the lion's share of imports at £459 million.

### Paperless info

A £25 MANUAL has been published by the Simplification of International Trade Procedures Board (SITPRO). Computers and International Trade Documents is intended to help exporters seeking to automate their documentation and it has the "end goal of a paperless information transfer".

### Centronics sues

CENTRONICS in the US is suing Integral Data, a computer firm, in the low end of the matrix printer market, in an attempt to prevent Integral from employing two former Centronics engineers for at least a year. Centronics alleges that they are conspiring with Integral to use Centronics trade secrets.

### Supercentre

CONTROL DATA is enhancing the supercomputer processing facilities on its Cybernetic network by adding two Cyber 203 machines to the existing Cyber 203 at its Minneapolis "supercentre".

# Private system links to Prestel on for next year

by Donald Kennett

BRITISH TELECOM has committed itself to providing a gateway from Prestel to third-party databases and computer services by March next year.

Software for the gateway was bought from the West German Bundespost late last year after it had been developed for the Prestel-based Bildschirmtext public viewdata service by Systems Designers Limited under contract to Aregon International.

It is now in use in trials in Berlin and Dusseldorf, each of which has 2,000 users. Ten mainframe computers - including IBM 370 and 4300, Siemens and Univac machines - are currently accessible from Bildschirmtext via the gateway system and 20 more are due to be linked up this year.

Further extensions and improvements to the gateway software were ordered by the Bundespost last week, under a contract which Aregon International's man-

aging director, Anthony Chandor, said was worth a five-figure sum.

Current service providers include mail order companies, a holiday company and a bank. Four more banks plan to offer services to account holders, including Deutsche Bank, one of the biggest banks in the world, which last week announced that its service called Dialog would start up in the middle of this year.

Verbraucherbank, a small and innovative bank which was an early user of cash dispensers, has already set the pace by making Bildschirmtext-based services available to all its customers. They can make transfers from their accounts, ask for statements and loans and start or stop standing orders.

UK banks are believed to be interested in providing similar services based on the Prestel gateway. Other likely users of the facility are travel agents, airlines, retail and



Prestel gateways to private computers enable public viewdata services to be used for banking, booking and shopping.

wholesale chains and other companies which need to shift information to or from a network of branches or dealers.

Availability of the gateway facility on Prestel is to start in London and spread through the UK during 1982. Links to Prestel centres

from private computers will use British Telecom's PSS packet network where appropriate and will integrate with the Prestel Advanced Network and Database Architecture, Panda, as it is implemented between next year and 1984.

Potential users of the gateway are advised to start preparing now if they want to be ready for the opening date, and SDL and British Telecom are running a one-day conference in London on March 18, to start their user support programme.

## Ops halt French statistics

by Jack Gee

THE French National Statistical Institute's headquarters at Nantes, on the Atlantic coast, has been paralysed for over a month by 40 terminal operators who refuse to resume work until they are given a ten-minute hourly break.

The operators, all young women in their early twenties, work at a centre which feeds vital information to France's most important data banks. These include Sirene (which lists business firms), the National Register of Voters, RIPP (which contains the national census findings and handles social security and pensioners' files), and SAF (which pools confidential Ministry of Interior information).

The operators, of whom only four belong to trade unions, say their work was tolerable last year while they were key punching data in batch mode. But the girls claim life became unbearable for them when Nixdorf minicomputers were introduced in November with interactive display screens.

A 24-year-old mother said: "We type between 700 and 1,000 pages a day. Of course, when I am tired and the letters begin to dance in front of my eyes, I can always stop the conversation by turning a key. But then the interruption is recorded and I risk losing my productivity bonus".



## ICL Model EDS 200 Disk Pack from Control Dataset.

You've invested in an ICL system. Now select the one 200 mb disk pack ICL design for it.

Already more users rely on the ICL Model EDS 200 disk pack than on any other 200 mb pack. For exclusive supply of ICL brand disk packs, and details of the unique ICL 4-year warranty, call Control Dataset on 0438 3322. Control Dataset Limited, P.O. Box 16, Argyle Way, Stevenage, Herts, SG1 2AB.



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From £495
- GRAPHICS ADD ON**  
Gives full vector drawing with complete Tektronix Plot-10 software capability to the ADM-3A/3A+.  
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- LEAR SIEGLER 300 BALLISTIC PRINTER**  
180 cps full specification heavy duty cycle printer.  
From £1210
- LEAR SIEGLER ADM-31**  
Two page display with full editing capabilities and four visual attributes.  
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Popular 30 cps terminal available as KSR, RO and paper tape ASR.  
From £776
- SIEMENS 60 PRINTER**  
Lowest cost, smallest sized 60 column impact printer in the world.  
From £269

## Oscar is on the launch pad

A LEAP in turnover from £80,000 last year to a current £1 million is on the cards for Milton Keynes company Interactive Data Systems, according to chairman James Spencer.

The company is about to launch a microcomputer labelled Oscar aimed at the small business market.

Spencer describes Oscar as "an up-market version of the Superbrain" (the machine produced by Icarus) and it will be the second launch from an 18-month-old company which, by the end of the month, will employ only eight people.

Priced at £2,495, the basic unit

is built round the S-100 bus and has a 12 inch VDU, 64 K bytes of memory and two 400 K-byte floppy disc drives. The S-100 has been adopted as a standard by the US Institute of Electrical and Electronic Engineers.

"We have a specialist market (in the computer industry) at the moment and it is possible for a small business to start up and become big very rapidly," says Spencer.

"But when you go to a bank and say your turnover is £50,000 and you hope to get a million, they think you're mad," he adds.

Interactive Data Systems has lined up three distributors for Oscar - Cullified Computer Systems

in London, Bynum, Shire and Ralston in Newport Pagnell. Formerly with Plessey, went independent with 100 board for Bynum, ended up supplying and substituting parts.

Interactive Data Systems is preparing a version of its two 800 K-byte floppy drives, Future plans include multiple installations, a processor version and a tape order for 100 units from many.

## Swansea leads with repair system

by Keith Jones

LOCAL authorities looking for a low-cost system to manage housing repairs could follow the lead of Swansea City Council which has just rejected a £70,000 ICL package based on the MB 29 in favour of the Decolli Democrat multi-screen microprocessor system.

Costing £36,000, the Democrat is supplied by Business Micro Systems Ltd of Harrogate which has written housing repair ap-

ware to meet Swansea's specifications.

Swansea's data processing manager Mike Collins believes that the software could be used by at least 20 other local authorities.

For helping with the specifications, Swansea will receive a royalty from BMSI, on every additional Democrat sale in this application area.

Collins described the Democrat as one of the few microcomputers

he knew of that could do mainframe compatible megabytes of Windows range and multiple users.

Swansea will own the micro and increase to 11, which will be used to update 20,000 housing files held on the council's storage.

They will also provide housing information on ICL 2973 and 2990 models.

## The Times moves towards 'direct input'

by Rory Johnston

COMPUTER typesetting equipment has been lying idle at The Times for three years will be brought into use at last following agreement between publisher Rupert Murdoch and the printers.

Supplied by SDC in California, the system will not be used as "a word processor" with journalists operating the keyboards.

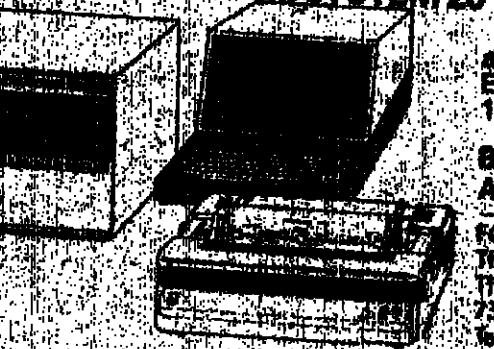
Redundancies of 50 per cent have been accepted by the Newspaper Guild Association, brought about by the higher throughput of the equipment and amalgamation of The Times and Sunday Times composing rooms.

Direct input by journalists, to which The Times management was committed, is not mentioned in the agreement, but there are signs that NGA staff are reconciled to conceding this eventually.

There are still problems whether journalists will have access to screens for direct input, overall agreement is the management's last year.

This was going to be a major first for The Times, but since the agreement is in place, the plan will have to be changed. The switch to direct input should take six months.

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# Extel



## Texas enters the gate array market with Schottky logic

TEXAS Instruments has moved into the gate array market with two initial devices, a 400 and an 800 array, using Schottky transistor logic (STL) technology. A new division has been set up within the company to cope with research and development.

Gate arrays are just part of the programmable semi-custom integrated circuit market, which is predicted to be worth \$20 billion worldwide by the late 1980s. In 1979 it was worth \$2 billion.

As a fraction of the worldwide semiconductor market, programmable devices will represent about 45 per cent by the late Eighties.

Although companies like IBM in the US and Ferranti in the UK have been in the array business for a few years, TI considers the Japanese companies its main rivals. IBM develops its semiconductor technology for in-house use and Ferranti is not automated enough to be considered serious competition.

TI believes that the key to its

success in the gate array market is its design automation capabilities, which have been developed over 12 years. Future plans are to link design terminals in Bedford with a main computer in Dallas, Texas.

### UK ventures

In the UK, two gate array ventures have been announced over the last six months. One was between Racal Microelectronic Systems (RMS) and General Instrument Microelectronics; the other from Marconi Electronic Devices (MEDL), the semiconductor branch of GEC.

MEDL has acquired an oxide isolated silicon gate CMOS technology called ISOCMOS from Canadian telecom manufacturer Mitel, with which it has had no experience of volume production. RMS and GIM are developing their own version of this technology, which is claimed by them to have the highest performance of those available today.

TI is branching out on its own, choosing STL as its gate array technology, although a form of CMOS will be considered in the company's future plans. STL is slightly faster than CMOS, but uses more power. TI has the benefit of a great deal of experience with Schottky TTL technology especially in volume production.

Desirable qualities in the choice of technology were high speed, low power consumption and room for scaling down. According to the graph of the speed/power product (SPP) the nearer a technology is to the axis, the better.

Both CMOS and STL can be scaled down to geometries near the one micron level. TI is now using five microns but expects to move to three using STL by the end of this year and one by 1985. At five microns using STL a typical gate delay is 2-2½ nanoseconds and typical power consumption is 300 microWatts. Using CMOS at five microns, gate delay is typically six nanoseconds and power consumption 90 microWatts.

### Advanced STL

At one micron, gate delay is typically 0.25 and 0.45 nanoseconds and power consumption is typically 130 microWatts for STL and 35 microWatts for CMOS. As geometries decrease, so does the speed/power product and so the performance of the gate arrays increases.

By scaling down to one micron geometries, TI hopes to produce a 10,000 gate array in advanced STL by 1985. Before this will come 1,000, 2,000, 4,000 and 5,000 gate arrays. According to TI, applications will increase with the capacity of the gate arrays. At the moment, TI sees its gate arrays as being particularly useful in the minicomputer, robotics, terminal and disc drive markets. They will also be applicable in all markets that previously used TTL technology.

After the 10,000 gate array device, TI plans to incorporate analogue functions onto chip. This may also extend to incorporating on-board ROM. As the chip contents increase, however, there is a need for a different method of packaging, such as a chip carrier or

a space array. TI has already plans for this.

The first two devices are TAT004 and the TAT008 former has 540 gates or segments groups (ABGs) of which 400 are usable gates. The gates form 30 internal cells by 6 format with 140 channels layout.

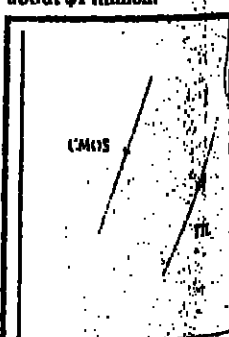
### Customise

TI produces the gate arrays in 140 channels of layout in a volume quantities and then interconnecting channels are needed in such a way as to make the chip for the customer.

This last task is done by the aid of a computer. The cycle is reduced from three months to four or six weeks, this dramatically reduces the cost of the circuit.

TI is charging two separate for its gate array service: a recurring cost and a fixed production cost. The former can be anywhere between \$10 and \$40,000. This should drop to \$12-15,000 by 1985.

The production cost for 5,000 and 10,000 units is \$10 per part. By 1985, this will drop to \$12 to \$20 per unit. TAT004 or TAT008 will be \$45 for a higher capacity. These costs may seem high, but a full custom cost for a 10,000 array chip would probably be about \$1 million.



A graph of internal gate delay (cal axis) versus power consumption showing the performance of CMOS and STL technologies over the five year period from 1981 to 1985, as geometries scaled down to one micron.

## CMOS technology from Lockheed

A 900 gate CMOS-on-sapphire gate array is being developed by Lockheed Microelectronics Centre in California and will be ready for evaluation and testing at the end of this quarter. IBM announced a 5,000 gate array chip last year using bipolar Schottky TTL technology.

Designed at four micron dimensions, the chip is claimed to be capable of clock rates of 30MHz with propagation delay per gate specified at less than two nanoseconds. Power consumption is claimed to be less than 50 microWatts per gate at 1MHz operation.

The first two products to use the array will be an eight by eight bit multiplier and a square rooter which are being developed in-house for a space application.

Meanwhile, Lockheed is also developing a higher density two

micron CMOS-on-sapphire process that will produce 10,000 gates per chip.

Using bipolar technology, Lockheed has achieved a power consumption of 460 microWatts per gate at actual measured gate delay of 1.5 nanoseconds.

In the UK, gate arrays are being developed by two separate groups using a silicon gate CMOS technology which is said by the companies involved to be the most advanced technology of the future.

Racal Microelectronic Systems and General Instrument Microelectronics are planning a 2,000 gate array for 1983, operating at 15MHz. Marconi Electronic Devices, part of GEC, is planning a 7,000 gate array using the acquired ISOCMOS technology from Canadian telecoms firm Mitel.

### Superbrain acts as teletype terminal

A SOFTWARE package which allows the Superbrain microcomputer to act as a teletype terminal is now available from City Software House, Symington, called TTY. The program permits the transfer of files to and from other computers, and allows the user to operate in CP/M while still using a host computer.

Communications are made to IBM, CDC, DEC, etc. The price of the package is £150.

# Are you being held 'hostage' by the Americans?

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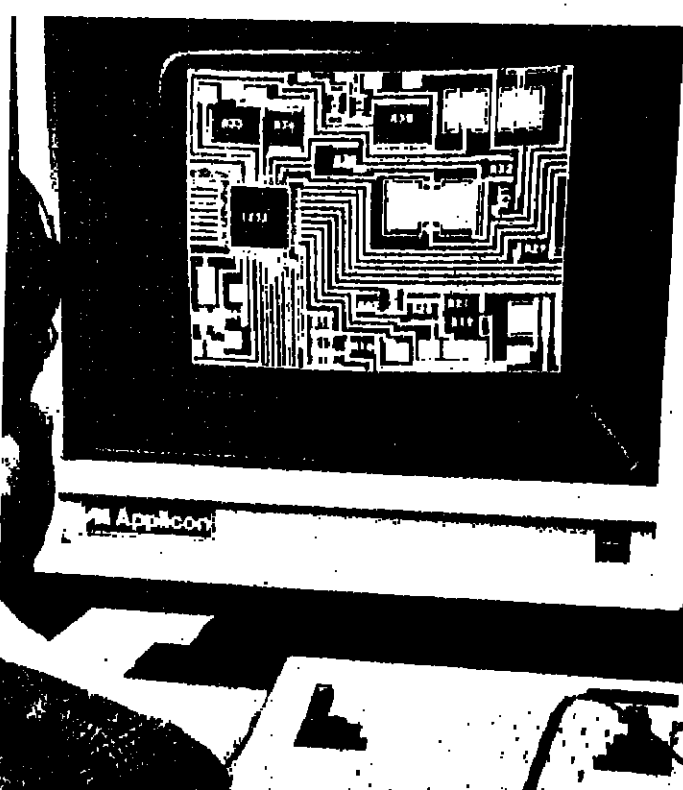
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THIS computer aided design and manufacturing system for hybrid design has been introduced by Applicon UK of Stockport. Called the Video Hybrid System, the interactive graphics system is claimed to increase productivity ten times over. VHS has the ability to extract from the design layout all the checking, documentation and manufacturing outputs required for hybrid production. It can be used in integrated circuit and printed circuit board design.

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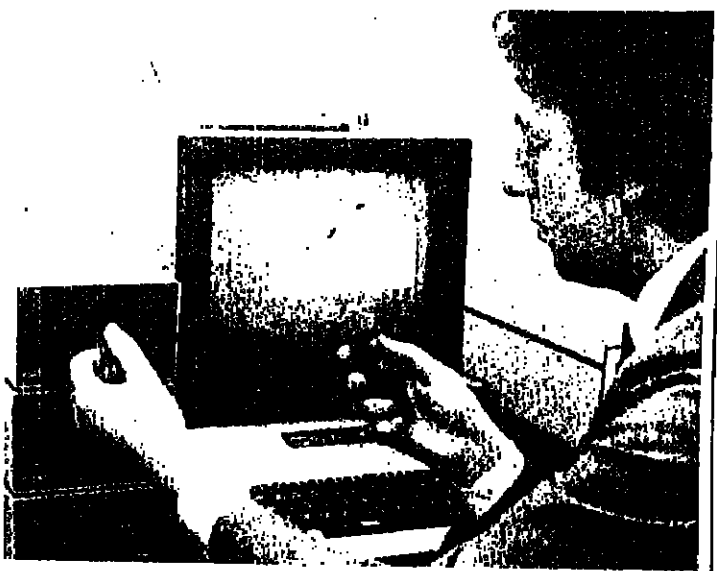
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Financial modelling on a microcomputer is now possible with a new program called Micromodeler, which has been developed by Intelligence and will be distributed in the UK exclusively by ACT Microsoft. Micromodeler costs £425 and can run on a £2,000-£4,000 worth of Apple II. A comparable mainframe software package would cost about £18,000.

## RMF figures 'err'

A REPORT from the US suggests that IBM's Resource Management Facility, part of MVS, may be out as much as 126 per cent in its estimation of exactly how CPU is used.

The study, undertaken at Occidental System Inc over a 17-month period, found that while RMF was accurate in its overall estimate of CPU use, its regional estimates are on average 22 per cent below in batch mode, 126 per cent under in TSO, and 25 per cent under in IMS.

If the results hold water—and similar studies by Amdahl also point out discrepancies in RMF estimates—then they suggest that MVS users are not able to estimate system upgrades accurately on the basis of information from RMF, although IBM in the US has said that it is not aware of any inaccuracies.

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# Cincom breaks new ground with development system

by Claire Good

PROGRAMMER productivity is the aim of Cincom's new application system, Series 80 Mantis, launched last month in the US.

The system is Cincom's latest move away from dependence on its main money-spinner, the database Total, and towards application-oriented tools, such as TIS and MRPS.

Series 80 Mantis promises "complete beginning to end online application development, without the need for batch processes". Hefly time-saving is quoted for programs produced using Mantis: five hours to complete development, where the same program took 24 hours using IBM's DMS programming aid and 80 hours using "conventional Cobol programming techniques."

Terry Booth, Cincom's UK

manager, believes that the product will be bigger than Total for his firm. "It started as an in-house tool, and Cincom in the US has been using it for over two years," he told Computer Weekly.

"It's hitting the market at exactly the right time; everyone's looking for productivity, and we're getting an incredible reaction to the product. Twenty-five were sold within eight days of its release in the US—not just to established Cincom customers, either, as it really is a standalone product."

Although the official UK release date is not until April 1, there is already a control site in the UK, and Booth says there has been a great deal of interest in the product.

Mantis is said to bring programmer and end-user closer to-

gether, with the emphasis on the design specification phases. The programmer can provide what Cincom describes as "a working model which can be modified to meet changing requirements." The code used on the model is actually an executable high-level language, said to need no more conversion once the user has approved it.

### Mixture

The language is a mixture of various features borrowed from Basic, PL/I, Pascal, and APL. Cubol, seen by Cincom's president Tom Nies as "archaic", was firmly excluded. The entire tool took over two years to develop.

Using Mantis, a programmer can implement an application in-

teractively in one sitting, or should not be seen as a program generator or debugger as a complete development tool.

Mantis can be used to test and debug applications as well as doing other tasks in system up and running. It has been used in system conversion and is said to be more powerful than operating systems monitors.

The system works with OS, CICS, and Cincom's monitor Enviro. It is about 200K-bytes of main memory and US prices give a likely cost, at \$20,000 for user licence (up to eight terminals) and \$500 as monthly

## FINAPL flies high with two marketing deals

FINANCIAL planning system FINAPL has landed two major marketing agreements, one with ICL Datskil and the other with US firm STSC, parent of the worldwide APL time sharing service, APL\*PLUS based in Bethesda, Maryland.

"FINAPL was developed in APL by the Manchester firm FARS Computer Services. FARS has been marketing the system for some time on Digital Equipment, Harris and IBM machines."

The Datskil agreement will make the system available to APL users with ICL 2900s running under VME/B. It is the first time ICL has APL products and it is likely that the joint agreement with FARS will lead to other APL ventures.

### Package range for Level 6

A RANGE of packages for the Honeywell Level 6 Model 200 computers has been developed by MBS Data Systems. Included is a suite of programs for sales, purchase and nominal ledger, sales order processing, stock control and payroll.

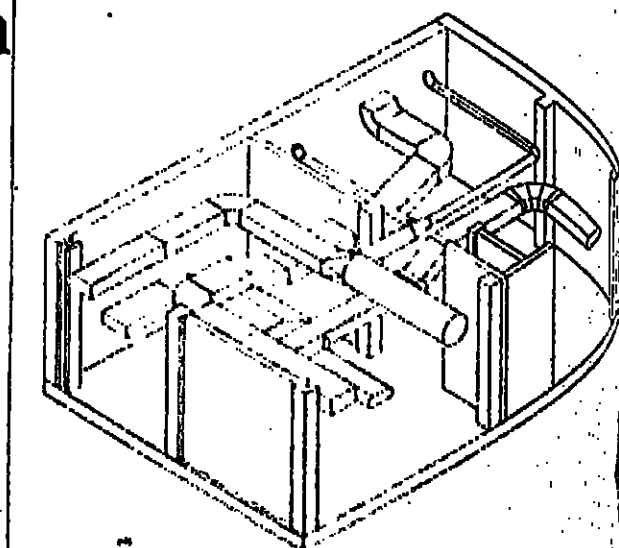
FINAPL complements the Propper Star planning and modelling system already available to non-APL 2900 users.

FINAPL also slots neatly into the APL\*PLUS range and Michael Hardwidge, managing director of the London bureau, described it as "an important addition to STSC's library of APL products."

The STSC agreement is significant in giving FINAPL an international market on the world-wide telecommunications network, and for the choice of British software by a company which can take its pick of APL products.

Geoff Kemmish of FARS, the man who wrote FINAPL, does not see the two contracts as a personal triumph but as proof of APL's commercial potential.

"From our point of view, it's good to find others to back the view we took long ago, that there is a market for APL packages and that there's no need to re-invent the wheel with every application." FINAPL is available already to users of the I. P. Sharp APL Service and the G81 time sharing bureau. For ICL machines it will cost £12,000.



Air ducting drawn with Tektronix graphics may help draughtsmen.

## Helping with donkey work

If you thought that the obvious person to produce diagrams of air ducts and ventilation in a building was a draughtsman, then you're wrong. The picture above was produced by a Prime computer, using Tektronix high resolution graphics, and a system called Compass.

Compass has been developed over the last couple of years by the Computer-Aided Design Centre at Cambridge, and the user, air-duct manufacturer Henry Hargreaves. It aims to help draughtsmen rather than put them out of work by taking them to the computer to generate diagrams, rather than spend hours drawing details.

The system helps in the layout and design of air ducts, generating scheduling and timing for the shop floor. It also creates diagrams and engineering documents for 3D models, which is fed into the keyboard using a design details.

## COMPANY NEWS

### Siemens results fall £10m

SIEMENS, the German electrical giant with more than half its turnover now concentrated in electronic components, communications and data processing systems, reports a fall in profit of almost £10 million, from £136 million in 1979 to £126 million in 1980. Turnover rose marginally from £6.3 billion in 1979 to £6.44 billion in 1980.

The company blames a sharp fall in the price of general purpose computers in the medium performance range for the losses mentioned in the data processing division.

The company had 1980 sales of £360 million in the DP division, £1.82 billion in the communications division and £300 million in the components division. No profit figures are shown for the individual divisions.

The German computer market, estimated to be the second biggest in Europe, is Siemens' home territory and the downturn in the German economy seems to have caught Siemens by surprise.

The outlook for the coming months is not promising, according to the company's new chairman, Dr K. H. Kaske.

The company, in its report, blames the fall in the Deutschmark for some of its problems.

This sort of comment would seem to contradict the universal moan of UK companies that the strong pound has caused them to lose international competitiveness. However, the explanation lies in the volume of foreign purchases involved in a company's sales and manufacturing mix. In the case of Siemens the relative cost of the Fujitsu M200 which Siemens markets as the top end of its 7000 range would have risen by upwards of 25% as the value of the Deutschmark has declined relative to the yen.

However, the cheapening of the DM should have a beneficial long-term effect for Siemens, though the company itself displays no optimism about either the domestic or international scene in the short term.

## CW SHARES TABLE

Date: 19/2/81		Index 88.88 Change: +0.88									
Fence		Lapdon Stock B-Share		Fence		US Stocks		US Stocks		Fence	
1001		Stone		Price		C/age		1001		Mock	
High	Low			High	Low	High	Low	High	Low	High	Low
188	111	A Group Vaux (50p)		135	120	21 1/2	19 1/2	19 1/2	19 1/2	19 1/2	19 1/2
189	112	S & C (10p)		135	120	+	4	19 1/2	19 1/2	19 1/2	19 1/2
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237	160	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
238	161	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
239	162	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
240	163	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
241	164	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
242	165	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
243	166	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
244	167	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
245	168	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
246	169	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
247	170	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
248	171	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
249	172	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
250	173	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
251	174	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
252	175	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
253	176	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
254	177	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
255	178	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
256	179	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
257	180	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
258	181	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
259	182	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
260	183	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
261	184	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
262	185	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
263	186	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
264	187	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
265	188	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
266	189	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
267	190	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
268	191	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
269	192	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
270	193	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
271	194	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
272	195	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
273	196	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
274	197	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
275	198	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
276	199	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
277	200	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
278	201	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
279	202	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
280	203	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
281	204	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
282	205	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
283	206	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
284	207	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
285	208	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
286	209	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
287	210	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
288	211	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
289	212	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
290	213	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19 1/2	19 1/2	19 1/2
291	214	Crested (50p)		135	120	12 1/2	12 1/2	19 1/2	19		







# Site where ops is the route to management

"INFORMALITY and professionalism need not be mutually exclusive," says Jim Cameron, the DPM at Leicester County Council's Univac installation. It's the kind of site where everyone knows everyone else and, perhaps more importantly, sees everyone else.

Glass partitions separate programmers from data prep, and then from the computer room. Four managers' offices stand opposite this overall computing area.

"We don't encourage segregation here," says Cameron pointing to the open plan arrangement. "On some sites, operators don't even know where the programmers are."

As far as career paths go, the conventional computer divisions of labour are not altogether respected at the Leicester site. Simon Bankin, for instance, moved away from operations to become senior control clerk and says: "I wouldn't want to go back to it, especially the shift work."

Operations manager Frank Heanaghan has had an even less typical career, having spent the first three and a half of his eight years on the site as a systems analyst. He switched to operations "in order to take an opportunity to become involved in management."

The notion that operations is the best DP route into management is echoed by shift leaders Paul Pail and Keith Martin.

"Having come up through programming," says Heanaghan, "I can appreciate programmers' problems and they know that I know." He places an emphasis on programmers understanding what goes on in operations and new, inexperienced programmers have to spend a couple of days in the machine room after they have arrived on the site.

There is now a fairly rigid graduate career structure for programmers, making the move out of operations difficult for the ops.

Recently there has been a low turnover of staff among the operators, which reflects the difficulty in finding fresh jobs. An advert for a junior op in the Leicester Mercury had over 120 responses, which is more than four times last year's response rate.

Most of the ops have started at a junior level because there are not many experienced Univac operators in the area. A spin-off from this scarcity is the policy to promote from within.

Only one of the current batch of nine ops is over 22, which makes their average age about the same as the Leicester City football team.

All training is done on site and is

the responsibility of chief op Hsu Misty. His career has been conventional, having started at the site seven years ago as a junior.

The ops themselves work a three-shift system from Monday to Friday, on a strict four-month rota, working nights one week in every three. The rota is designed

so that within the four months each op works with the other eight.

"We're a close-knit team," says shift leader Allan Ralph. They earn a 20 per cent shift allowance worth between £1,500 and £2,000 on the council grade of their salaries.

Those I spoke to said they had adapted to night work and liked the free time it gave them during the day.

The site has been with Univac for eight years and before that it had an ICL 1902A. It has to cope with the payroll for 33,000 council employees and handles 10,000 invoices per week. There are 30 terminals scattered about the county with 20 schools sharing four telephone lines.

"The service to the schools," says one of the ops, "has very little effect on our work."

Heanaghan says that his daytime priority is to keep the terminal users happy, and to keep some batch work ticking over. The large batch

work is left for the evening shifts.

It is primarily a system with five 8433 disc drives and a megabyte 8434s. Some of the half-inch tape provision.

They have just moved Level 33 of the Empire system to Level 14. It worked with it for a long time but it was an improvement.

Allan Ralph says: "The system gives back a meaningful and a slightly faster. The output and output is slightly but the best remained similar."

Although I was only for a short while, I was must relaxed I've been took over Op Spot.

"Look at that man," says the ops as I was there. "He's a programmer. Look at a shirt, trousers, almost normal!"

When he first co-ordinated these ideas, Deans was unable to get backing from a university research department to test his theories, but continued to refine them until eventually he produced Science Uncoiled.

If he is right, there are some important spin-offs to his theories. Certain trace elements notably lacking in Western diets may contribute to the high incidence of degenerative diseases, like cancer and heart failure, in the Western world.

These ideas are unproven, however, and the absence of experimental corroboration or appearance of articles in scientific journals has not helped in getting his book published.

Thwarted by both research departments and publishers, Deans decided to harness the blossoming sort program to his cause, reasoning that money accrued



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Ideas for the future: Allan Ralph, on the left, would like to give a try but wouldn't like to say goodbye to his shift allowance. He has toyed with the idea of doing contract work in France but has himself a mortgage. Paul Pail has no plans to leave operations but that it will give him the chance to move into management.

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He had had a good deal of favourable feedback on Selesort but there had been practical difficulties in getting it adopted by software publishers.

"I'm told there is little demand for a more sophisticated sort. The whole accent now is on user-friendly, complete business systems incorporating a more limited sort."

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Did Deans think he'd made a mistake in his original assessment of the market? If so, what now for Selesort?

"Yes, I think I did get it wrong but I shall go on tidying up Selesort and, if I package it, I may be able to interest the smaller business, like a job agency or stock

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# Science Uncoiled acts as a launching pad for Selesort

"MICHAEL DEANS has produced the finest and fastest set of sort programs for micros." These are the emphatic words of Cyril Grant from the Microcomputer Centre at Sheen, London.

He goes on to say that "they are years ahead of the rest of the market at the moment."

Deans is a 33-year-old Londoner who trained as a biochemist, but has been a programmer for the last eight years with the London Borough of Hounslow. He wrote Selesort two years ago and the story behind its production is as interesting as the programs.

He explained, "I acquired a Pet system in 1978 and found I needed to learn machine code for another project I was working on. To gain practice, I decided to write some system software for the Pet, a friend suggesting a selective sort as there wasn't a suitable one."

Deans wrote a sortmerge facility, similar to those available for large mainframes, offering up to 15 specified sort fields.

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Michael Deans trained as a biochemist but eight years ago chose to become a computer programmer with the London Borough of Hounslow. He has achieved prominence through his development of Selesort, which has been described as "the finest and fastest set of sort programs for micros". Selesort is the subject of his still unpublished book, Science Uncoiled.

from developing a successful software system should go quite some way towards financing his project.

"I intended to put the royalties into a charity fund and offer it to any department that would investigate my ideas. My target was £500,000," Deans explained. With this in mind, he developed Selesort in a systematic fashion.

Selesort is presented as a Basic program for disc or tape storage with quite a large portion — around 5K — of machine code divided into two main parts, the sort field compiler and the sort/merge module.

Both are overlaid at the top of RAM, while subsidiary machine code sub-routines fill both cassette buffers.

The rest of the program is written in Basic and is concerned solely with file access with a theoretical limit of 64 sub-files each with 85 records, a total of 5,440 records.

Similarly, the sort-merge is capable of merging 64 input files at one operation in theory but since file opening and closing is the slowest part of the system, the optimum number of files for overall speed is around nine in practical terms.

Besides more conventional alphabetic and numeric sorts, data can be re-arranged in a variety of ways — upper and lower texts can be sorted together, or binary and floating point numbers differentiated.

To illustrate Selesort's uses, particularly in selecting a specific record type for display, information or editing, Deans has produced a series of theoretical case histories.

One application he describes is a sort into ordered lists, such as alphabetic registers of students, teachers, or employees.

Records may be loaded on file in any order — seniority, works number, etc, but by using Selesort the whole file, or extract, can be copied and sorted alphabetically, leaving the original order undisturbed.

Merging short-term files into a more permanent form with subsequent sort, can have advantages over a direct access update. Where a central file is maintained to cover separate installation files, update is often by real time direct access.

An alternative is to merge individual periodic transaction files and re-sort into the central file order.

This allows either sequential update of the central file, or merge of

the new and transaction files, both occupying the micro and operator for a few minutes at various times rather than several hours at the end of the month.

A sort can also usefully update customer accounts where payment is falling due. Using Selesort's ALTN feature, a file organised in customer order can be split into accounts-due-now at the front in ascending order of amount, followed by accounts-due-next-week in descending amount order.

A personnel file could be sorted similarly on the basis of several key features — perhaps Urdu speaking with IBM experience — into a short list or, by specifying a cate-

gory to be excluded, screen out certain candidates.

Sorting out words is another application. If each word is defined as a record in a processing system, it can be sorted as required, the duplicate feature listing all repetitions of a word throughout the text.

Spelling and technical jargon can be checked by comparing the duplicate list against a standard of all common words and terms. An "unmatched" output report indicates error or explanation.

Searching the phone directory for a John (or?) F. may seem a lost cause, but specifying that the name field contains a "J" will bring a list to the front of the file.

Looking for subsequent 'o' or 'Q's, 'n' or 'N's, produces further lists which can be cross-checked or eliminated, this technique extending to other mislaid items, references or classifications.

A selective sort can also handle chores like checking one file

against another (did we update this month?), preparing indices and calculating statistics.

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"Users seem satisfied with this; they either don't realise what else is available or don't want to get involved."

He added: "I think it's also a question that people don't yet know enough of what the computer can do."

Did Deans think he'd made a mistake in his original assessment of the market? If so, what now for Selesort?

"Yes, I think I did get it wrong but I shall go on tidying up Selesort and, if I package it, I may be able to interest the smaller business, like a job agency or stock

control, where a selective sort is needed."

I asked a little tentatively what would now become of Science Uncoiled.

"I have quite a lot of work to do on it — perfecting the database on the Pet, final revisions and rewrites, that sort of thing."

"I also have some more thoughts on software. I'm considering developing into graphics, using the Pet to produce pictures with the aid of data compression techniques."

"That fits in quite well with my work on assisted learning programs in primary schools for Hounslow Borough."

"There may also be a future in video games linked to pop songs or film characters. The software to tie the game to a theme would be prodigious but a package to ease the load may be commercial."

I left Deans reflecting on all the possibilities open to his agile mind. He isn't at all downhearted.

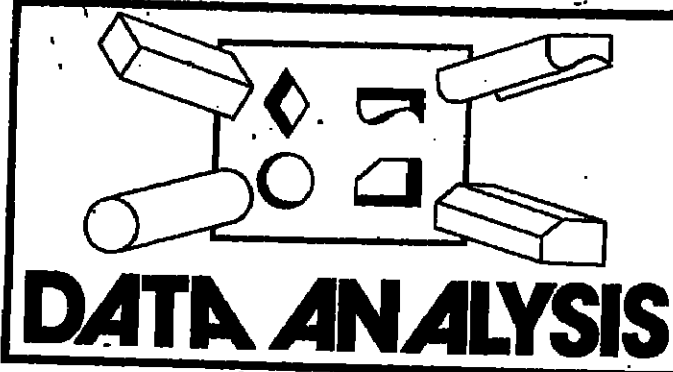
"Whatever the outcome," he says, "I don't feel too hindered. I've enjoyed my theories — they've given me intellectual exercise and the chance to compare ideas with other minds."

"Mentime, my book has had time to improve and the recession won't last for ever. Time will tell in the end if my ideas are right — and that may be in 20 years or next year."

against another (did we update this month?), preparing indices and calculating statistics.

"I'm in the process of customising Selesort," said Deans. "





# Matrix is last phase in entity life cycle analysis

Elementary Function (Event)	Booking	Cancellation	Appointment Time Expires	Patient Arrives	Inquiry	Archived
Not Known to System Business	booked	E	E	E	E	E
Booked	E	cancelled	broken	kept	booked	E
Broken	E	E	E	E	broken	archived
Cancelled	E	E	E	E	cancelled	archived
Kept	E	E	E	E	kept	archived
Archived	E	E	E	E	E	E

Figure 1. Entity life cycle matrix (Appointment).

IN Parts 16 and 17 entity life cycles have been examined as a method of checking that all the events and functions have been analysed, providing validation rules for use in system and program design and designing programs around entity types.

Now we examine the last two purposes more closely, using the last phase of entity life cycle analysis — the entity life cycle matrix.

The entity life cycle matrix provides information required in order to design verification and transaction processing programs for entity types: it shows:

- Where a transaction or event is invalid for an entity in a given state.
- Which elementary functions are invoked as a result of a transaction when the entity is in a certain state and what effect the function has on the state of the entity.

## Section 1 — Part 18 of our series describing a system design methodology by Rosemary Rock Evans

In Figure 1, the entity life cycle matrix for the appointment entity type is shown, using the events isolated in the Part 16 article on entity life cycle analysis and the valid states identified in Part 17. The valid states are listed in the left-hand column of the table and the events and elementary functions they initiate are placed at the top of each column.

### Drawing the matrix

Intersection of the rows and columns shows the resultant entity state after the function shown in the column heading has been executed on the entity in the state described on that row.

In our example, the resultant state after the function "Cancellation" is "Cancelled". Where the function is invalid for an entity in that state, it denoting error is used.

An entity life cycle matrix is drawn for each mutually exclusive group of entity sub-types found, as described in Part 17.

Hence, there would be one matrix for the group of states:

- (Under 16 Single)
- (Over 16 Married)
- (Over 16 Divorced)
- (Over 16 Widowed)
- (Over 16 Single)

If we were completing entity life cycle matrices for the patient entity type.

Before leaving entity life cycle analysis to deal with other topics, it is worth stating some of the advantages to the analyst of the entity life cycle approach and its end products.

The Valid State table and entity life cycle diagram (if it is not too complex) and entity life cycle matrix provide a means of checking methodically, with the user, all the valid event and function sequences and all the valid states.

Validation is often treated as though it were a task that could be done with the user. Analysis compact tool enabling the analyst to check the validity of the data and functions.

All attribute types during entity modelling are identified by reference to the model and the model is checked to ensure that the function is truly dependent on the attribute types identified.

For example, a user said that a function was upon whether the patient was a pensioner or not a pensioner.

If the definition of the function was examined with regard to events which affect it, could have two possibilities:

1. Reaches 65 (the Woman)
2. In receipt of a pension being paid a pension fund.

The function may be for one of these states, the function should be given a better description. We are beginning to differentiate parts of the entity, attributes, states, etc. together, extra knowledge being up definition and possibly change the model of function if it is not known.

At this stage we are close to being able to use the design process itself, now required is to draw the design process itself, now required is to draw the design process itself, now required is to draw the design process itself.

The Data Analyst has developed a GAT Palmer.

# MICROSYSTEMS'81

March 11, 12 & 13, 1981 — Wembley Conference Centre, London

## Have you booked in yet for Britain's leading microcomputer event?

- Exhibition — see the latest microcomputers, peripherals and software on more than 100 exhibition stands.
- Conference Sessions — Share the experiences of those who are professionally involved in the design, development and application of micro-based systems.
- Professional Development Courses — Get to grips with microprocessors and their application in three one-day courses run by ICS — the leading training company.

### WEDNESDAY 11 MARCH

Chairman: Howard Kohnstein, Intel, UK  
Local area networks — a merger of computer and communications technologies  
C.C. Baze, Vice President, Ungermann-Bass, USA

Distributed Processing  
Chairman: Howard Kohnstein, Intel, UK  
Microprocessors in a distributed processing network  
P. M. Jackson, Modular Business Systems, UK

Chairman: Howard Kohnstein, Intel, UK  
All approach to special purpose multi-microprocessor systems  
Development Systems  
Chairman: Howard Kohnstein, Intel, UK

Chairman: Howard Kohnstein, Intel, UK  
A low cost and cost-effective support system for the Intel 286  
J. Ward, A. Kohnstein & J. Ward, London University of the Midlands, UK

Chairman: Howard Kohnstein, Intel, UK  
The design of a universal microprocessor development system  
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Professional Development Courses — Get to grips with microprocessors and their application in three one-day courses run by ICS — the leading training company.

## PEOPLE Ex-CPP staff take positions at ADR

FOLLOWING redundancies made by CAP-CPP two months ago, several people have transferred from CPP to Applied Data Research Ltd (ADR), to market and support the ADR software products that were previously sold by CPP under licence. The new appointments bring the staff total to 17, more than double the figure at the company's inception in April last year. Parent company is ADR, an international company with headquarters in the US. Michael Wood is administrative manager. He was with CPP for seven and a half years, and prior to that was production controller at Computer Projects. David Turner has been appointed field sales manager for general products. Senior technical support representative is John West, and Stephen Morton has joined as technical support representative. Four salesmen have transferred to ADR. They are Richard Tibbetts, David Chamberlain, Richard Elms and Tony Thompson. John Wilson joins the company after 10 months with CPP. He is responsible for technical support of Roscoe and Look.

## Shipper of the year

MANCHESTER shipping officer Ian Allcroft has been named Shipper of the Year for presenting the best paper on how computers can help exporters improve their efficiency. The competition is held annually by trade journal International Freight Weekly. Allcroft won a holiday for two in Lisbon, after being questioned on his hopes for the future of computers in international distribution.

Second prize winner was Anthony Rowan of Crosol Ltd, Halifax and third prize went to M. W. Padbury, shipping manager of Siemens. The competition was co-sponsored this year by International Freight Weekly, British Caledonian, SPD International and the Society of Shipping Executives.

## DIARY

**FEBRUARY 25**  
Access credit card system, BCS Edinburgh branch, Mountbatten Building, Heriot-Watt University, Graysmarket, 5.30.

Development of software for linear programming, BCS Mathematical Programming Group, London School of Economics, 6.30.

Developments in data communications in Europe, BCS North Staffs Branch, Computer Centre, North Staffs Polytechnic, 8.00.

Microprocessors and applications, IDPM, Norfolk branch, Castle Hotel, Norwich, 7.45.

At this stage we are close to being able to use the design process itself, now required is to draw the design process itself, now required is to draw the design process itself.

**FEBRUARY 26**  
String Something Simple, BCS PLT Group, Third Floor, Imperial House, 15-19 Kingsway, London WC2, 5.45.

**MARCH 3**  
The Role of the User/Supplier

**MARCH 10**  
The Role of the User/Supplier

**MARCH 17**  
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**MARCH 24**  
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# How to ensure the best choice of multiprocessor

Multiprocessors: A Comparative Study, by M. Satyanarayanan. 201 pp. £14. Prentice/Hall International, London.

DESPITE the influx of micro-computing and compact business systems, the multiprocessor market is expanding.

Cost-effective computer economics for the large-scale user gives a prominent edge to the medium and large system, especially when multiprocessing benefits apply.

The book's introduction suggests that much is known about academic and research multiprocessing equipment but there is no such wealth of knowledge relating to industrial and commercial systems.

In fact, manufacturers' manuals offer only marginally relevant material. Correcting this sorry state of computing affairs was the challenge presented to the author.

It is refreshing to find a technical writer who is both well-informed and capable of informing his readers.

M. Satyanarayanan, who is a member of the Department of Computer Sciences at Carnegie-Mellon University, has produced a first-class review of eight major multiprocessor computer systems.

The format established is a general purpose review of each system followed by in-depth studies and evaluation, each section covering the central processor, input/output channels and operating procedure.

Satyanarayanan probably reflects the majority viewpoint that the Burroughs B7700 is a fine system once mastered. Similarly, the IBM 370 model 168 is given an encouraging pat on the CPU.

The author adds the reservation that there is room for possible improvement in the I/O substructure.

He expresses rather more hesitation about the DEC PDP-10 but does acknowledge that the system is capable of meeting the requirements of most popular time sharing systems.

There is a highly comprehensive bibliography which appears to have encompassed every journal or magazine published since 1970.

Published in the Prentice-Hall software series, the book is valuable reading for everyone involved at operations level or those just contemplating taking the multiprocessor plunge.

Prentice-Hall acknowledges the assistance the compiler received from the associated university computerised production facilities. The further reading guide suggests that the compiler also has access to a multiprocessor data bank.

ALAN SIMPSON

## Bit like a classroom exercise

The Use of Microprocessors, M. Aumaux, 198pp. £12. John Wiley & Sons Ltd, Baffins Lane, Chichester, Sussex.

THE DAY when the publisher of a computer book actually assumes that the reader has some previous knowledge of microprocessors will be notable.

The Use of Microprocessors is no exception and the reader is once again deep into the heart of mathematics, physics and basic computing principles before he can say flip-flop or floppy disc.

Using microprocessors is just about the one subject not covered in the volume and How To Use the Micro would be a far more apt title.

However, allowance has to be made for loss of amplitude, the

book having been translated from basic French to practical English.

The translator did not attempt to convert French francs into pounds sterling or interpret such statements as "The cost of the microprocessor and its extra components are significant only when large numbers, 1,000 or more, are involved. In this case, when the cost of the design study is divided between each system it can become lower than the price of the components."

A further riddle is why the publisher could not commission an English-speaking author whose species must be readily available in the UK education network.

Had a non-French author been involved, the resultant book would not have been so biased towards

the Intel 8080A and Motorola 6800 systems.

The book reads like an extended lecture or classroom exercise and readers are invited to attempt a set of questions at the end of each section with answers provided at the end of the book. As an exercise, the book cannot be awarded high marks.

Publisher, author and translator could perhaps have done better, and it is to be hoped that in future editions the book, published in the Wiley Interscience series, will include more comprehensive indices plus an up-to-date bibliography.

It would also be advisable for the book to be directed towards the popular personal computer market.

A.S.

## When IBM is expendable...

Your First Computer by Rodney Zaks, 258pp. Sybex Inc., 2344 Sixth Street, Berkeley, California 94710.

JUDGED purely on publication rates, the marketplace for books on first-time computers could well rival that for computer equipment.

Latest in an apparent never-ending line of helpful advice offered to potential computer users is "Your First Computer - A Guide to Business and Personal Computing, by Dr Rodney Zaks, a prolific American writer and teacher on all things microcomputing."

Your First Computer, it should be established clearly, is expected to be a Pet or Apple. IBM is

mentioned only peripherally as being a supplier of a model 5120, a model whose price is higher than most integrated computers.

Having dismissed the world's major computer supplier, the book launches into brief, but nevertheless highly relevant, descriptions of other manufacturers and products.

As a basic primer for microprocessor enthusiasts, the book offers a comprehensive and enlightened guide to the expanding world of personal computing.

Like so many similar books on microcomputing, it is strong on what the notably sketchy value for the user.

Dr Zaks makes the interesting observation that tomorrow's system will always be cheaper than today's. Readers should not sit back at this point until such time as the micro is given away with the software at the local branch of W. H. Smith.

According to Dr Zaks, everyone's life will be changed by the microcomputer and the universality of silicon chips is closer than we thought.

An appendix, listing current US microcomputer magazines makes a fascinating study. Dr Dobbs' Journal, Nibble and Silicon Gulch Gazette certainly suggest that the industry is becoming more and more of a free-for-all.

## Bringing accountancy up to date

Guide to Systems for Practising Accountants, Ed. B. Knight, Computer Guides 1980.

FRAGTISING accountants are aware by now that their professional systems are rapidly becoming obsolete. Computerisation, but periodically, although some of their clients may have been using a computerised system successfully for some time, using a computer in the accountant's own office is still comparatively rare.

Because of the cost of a mainframe machine and the lack of expertise, all but the largest firms have found it necessary to employ a computer bureau.

Now the position is changing rapidly and the professional accountancy journals comment on the use of the computer and small systems that are becoming available.

Guide to Systems for Practising Accountants is a useful introduction to the use of the computer in accountancy. It covers the range of available facilities, the costs of hardware and software, and the various methods of implementation. It is a useful guide for accountants who are considering the use of a computer in their office.

There is also a section giving hardware particulars for each computer system. This is a useful feature, particularly for those who are considering the purchase of a computer system.

The book is well written and easy to read. It is a useful guide for accountants who are considering the use of a computer in their office. It covers the range of available facilities, the costs of hardware and software, and the various methods of implementation.

The first third of the book is

Dr. PETER WALLIS surveys the latest on languages

## Simula textbook takes pain out of learning

SIMULA BEGIN, by G. M. Birwistle, O-J Dahl, B. Myhrhaug and K. Nygaard. 393pp. £6.50. Input Two-Nine.

A SIMULATION language based on Alog 60, Simula was designed at the Norwegian Computing Centre in the late 1960s and the present book is the revised second edition of a student text on the language first published in 1973.

It remains the main accessible reference on Simula and is intended primarily as a lucid tutorial text for those wishing to learn the language.

The book is of wider interest than this limited aim implies.

First, it may be read as an entertaining and thought-provoking collection of worked programming examples and exercises, for purposes as varied as simulating a post office or car-wash, threading a maze, or symbolic differentiations.

Secondly, the designers of Simula had some remarkably advanced ideas for the period when

the language was designed, such as the Simula CLASS concept foreshadowing abstract data types and quasi-parallel programming methods relating to features of later languages, like Ada Tasking.

While the main parts of the book presenting the detailed features of Simula are somewhat dated, the discussions of Chapters 1, 8 and 9 on System Description, A Program as Components in Quasi-Parallel, and Simulation are still of great interest.

Although the reader is warned explicitly that the book is not about the language as a simulation system, the discussions of computer simulation seem particularly valuable.

Potential readers should not be deterred by the slightly old-fashioned appearance presented by parts of the book, or by the limited contemporary appeal of Simula as a programming language, this remains an important work deserving careful study.

## Solving Fortran problems

Problems for Computer Scientists Using Fortran, by M. Walker. 230 pp. Wm. Throp Publishers Inc.

THIS work is based on an 'student use in a Fortran programming course at Grinnell College, Iowa. Part I is a general introduction to Fortran programming while Part II is devoted to solving representative problems from a number of different areas.

The teaching material is to show the student how to develop a series of programs of increasing sophistication.

Problems stemming from a large amount of detailed information that must be handled by ingenious physical conventions the day after the relatively simple commentary.

All features of Simula are covered. It is a commendable attempt to have produced a comprehensive presentation of Fortran with many examples and problems, and a number of remarks on program design in many places.

Part II presents some programming problems of sorting, progressing in specialised problems under subject.

There are sections on programming as applied to algebra, trigonometry, calculus, physics.

Many examples and problems are given and the knowledge assumed in the subject seems to be useful first-year undergraduate level.

The most intriguing entry from Computatug takes the form of Kathy's Boys from British Petroleum," he added.

There is early evidence of just how seriously entrants are taking this year's competition, which includes both a domestic and international element.

# Only nine days left to join the 'superstars' in this year's DP Olympic Games

COMPUTASTARS and Computatug organiser Gordon Cairns is not a worried man. He is merely concerned that scores of potential competitors for this year's events may not realise how close is the deadline for this year's competition.

"There are only nine days to go before the closing date of February 28", Cairns explained. "So far, we have some 35 teams on register for Computastars and fewer than 10 entrants for the Computatug, but this is only the tip of the iceberg."

"One interesting feature is that over 50 per cent of the Computastars entry comes from teams new to the competition. Some have even awarded themselves exotic competitive titles."

"Perhaps the most striking is from Kalamazoo, which has styled itself the Kalamazoo Superstars before a competitive event has taken place. There's an optimistic note on which to begin your first venture into Computastars!"

"Other new entries include the Citibank Shylocks, Sandvic Vikings, Rascal, the Reed Group, Microscope and Elstree Computing."

"The most intriguing entry from Computatug takes the form of Kathy's Boys from British Petroleum," he added.

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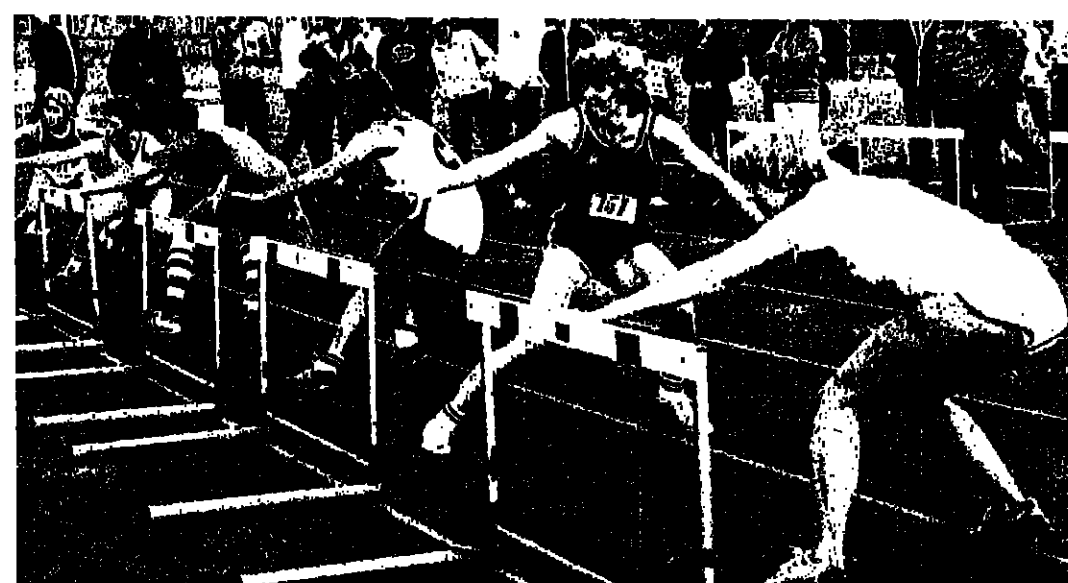
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Ready to go over the top... six of the best ladies - including eventual joint individual winner Bridget Cuthill (second left) - prepare for last year's hurdle race at the New Alexandra Stadium, Perry Barr, Birmingham.

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Hewlett-Packard Ltd (CW), Computer Systems Group, King Street Lane, Wokingham, Wokingham, Berks. Tel: 0734 784774.

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Belle Vue, Manchester  
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We have read and accept the conditions of entry for the Computatug 1981 competition and would like to enter .....men's .....women's teams

Name of team/individual .....

Company .....

Address .....

Name of contact for team(s) .....

Telephone No .....

Signature of DP manager or equivalent authority .....

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Enclosed is £..... to cover the entry fees for the team(s) cheques payable to COMPUTATUGS LTD. In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTATUGS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690.

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# How to ensure the best choice of multiprocessor

Multiprocessors: A Comparative Study, by M. Satyanarayanan. 201 pp. £14. Prentice-Hall International, London.

DESPITE the influx of microcomputing and compact business systems, the multiprocessor market is expanding.

Cost-effective computer economics for the large-scale user gives a prominent edge to the medium and large system, especially when multiprocessor benefits apply.

The book's introduction suggests that much is known about academic and research multiprocessor equipment but there is no such wealth of knowledge relating to industrial and commercial systems.

In fact, manufacturers' manuals offer only marginally relevant material. Correcting this sorry state of computing affairs was the challenge presented to the author.

It is refreshing to find a technical writer who is both well informed and capable of informing his readers.

M. Satyanarayanan, who is a member of the Department of Computer Sciences at Carnegie Mellon University, has produced a first-class review of eight major multiprocessor computer systems.

The format established is a general purpose review of each system followed by in-depth studies and evaluation, each section covering the central processor, input/output channels and operating procedure.

Satyanarayanan probably reflects the majority viewpoint that the Burroughs B7700 is a fine system once mastered. Similarly, the IBM 370 model 168 is given an encouraging pat on the CPU.

The author adds the reservation that there is room for possible improvement in the I/O substructure.

He expresses rather more hesitation about the DEC PDP-10 but does acknowledge that the system is capable of meeting the requirements of most popular time sharing systems.

There is a highly comprehensive bibliography which appears to have encompassed every journal or magazine published since 1970.

Published in the Prentice-Hall software series, the book is valuable reading for everyone involved at operations level or those just contemplating taking the multiprocessor plunge.

Prentice-Hall acknowledges the assistance the compiler received from the associated university computerised production facilities. The further reading guide suggests that the compiler also has access to a multiprocessor data bank.

ALAN SIMPSON

## Bit like a classroom exercise

The Use of Microprocessors, M. Aumaux, 198pp, £12. John Wiley & Sons Ltd, Baffins Lane, Chichester, Sussex.

THE DAY that the publisher of a computer book actually assumes that the reader has some previous knowledge of microprocessors will be notable.

The Use of Microprocessors is no exception and the reader is once again deep into the heart of mathematics, physics and basic computing principals before he can say flip-flop or floppy disc.

Using microprocessors is just about the one subject not covered in the volume and How To Use the Micro would be a far more apt title.

However, allowance has to be made for loss of amplitude, the book having been translated from basic French to practical English.

The translator did not attempt to convert French francs into pounds sterling or interpret such statements as 'The cost of the components are significant only when large numbers, 1,000 or more, are involved. In this case, when the cost of the design study is divided between each system it can become lower than the price of the components'.

A further-riddle is why the publisher could not commission an English-speaking author. The species must be readily available in the UK education network.

Had a non-French author been involved, the resultant book would not have been so biased towards

the Intel 8080A and Motorola 6800 systems.

The book reads like an extended lecture or classroom exercise and readers are invited to attempt a set of questions at the end of each section with answers provided at the end of the book. As an exercise, the book cannot be awarded high marks.

Publisher, author and translator could perhaps have done better, and it is to be hoped that in future editions the book, published in the Wiley Interscience series, will include more comprehensive indices plus an up-to-date bibliography.

It would also be advisable for the book to be directed towards the popular personal computer market.

A.S.

## When IBM is expendable ...

Your First Computer by Rodney Zaks, 258pp, Sybex Inc., 2344 Sixth Street, Berkeley, California 94710.

JUDGED purely on publication rates, the marketplace for books on first-time computers could well rival that for computer equipment.

Latest in an apparent never-ending line of helpful advice offered to potential computer users is Your First Computer. A Guide to Business and Personal Computing, by Dr Rodney Zaks, a prolific American writer and teacher on all things microcomputing.

Your First Computer, it should be established clearly, is expected to be a Pet or Apple. IBM is mentioned only peripherally as being a supplier of a model 5120, a model whose price is higher than most integrated computers.

Having dismissed the world's major computer supplier, the book launches into brief, but nevertheless highly relevant, descriptions of other manufacturers and products.

As a basic primer for microprocessor enthusiasts, the book offers a comprehensive and enlightened guide to the expanding world of personal computing.

Like so many similar books on micro, it is strong on what the micro does and how it does it, but notably sketchy on its value for the user.

Dr Zaks makes the interesting observation that tomorrow's system will always be cheaper than today's. Readers should not sit back at this point until such time as the micro is given away with the software at the local branch of W.H. Smith.

According to Dr Zaks, everyone's life will be changed by the microcomputer and the universality of silicon chips is closer than we thought.

An appendix, listing current US microcomputer magazines makes a fascinating study. Dr Dobb's Journal, Nibble and Silicon Gulch Gazette certainly suggests that the industry is more aptly described as 'later-day Klondike' rather than a micro-rush.

A.S.

The first third of the book is

bringing accountancy up to date

Guide to Systems for Practising Accountants, Ed. B. Knight, Computer Guides 1980.

Practising accountants are aware by now that their professional systems are readily accessible to computerisation but paradoxically, although some of their clients may have been using a computerised system successfully for some time, using a computer in the accountant's own office is still comparatively rare.

Because of the cost of a mainframe machine and the lack of expertise, all the largest firms have found it necessary to employ computer bureau.

Now the position is changing rapidly and the professional accountancy journals are increasingly up to the minute on the systems that are becoming available.

Guide to Systems for Practising Accountants is a useful introduction to computerisation for practising accountants and covers the range of available facilities. It considers the specific requirements of smaller and medium-sized offices where it is unlikely that specialist staff will be employed and there is a marked emphasis on the microcomputer and the microprocessor.

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## Dr. PETER WALLIS surveys the latest on languages Simula textbook takes pain out of learning Solving Fortran problems

SIMULA BEGIN, by G. M. Birtwistle, O.J. Dahl, B. Myhrhaug and K. Nygaard. 393pp, £6.50. Input Two-Nine.

A SIMULATION language based on Aol 60. Simula was designed at the Norwegian Computing Centre in the late 1960s and the present book is the revised second edition of a student text on the language first published in 1973.

It remains the main accessible reference on Simula and is intended primarily as a lucid tutorial text for those wishing to learn the language.

The book is of wider interest than this limited aim implies. First, it may be read as an entertaining and thought-provoking collection of worked programming examples and exercises, for purposes as varied as simulating a post office or car-wash, threading a maze, or symbolic differentiations.

Secondly, the designers of Simula had some remarkably advanced ideas for the period when

the language was designed, such as the Simula CLASS concept foreshadowing abstract data types and quasi-parallel programming methods relating to features of later languages, like Ada tasking.

While the main parts of the book presenting the detailed features of Simula are somewhat dated, the discussions of Chapters 1, 8 and 9 on System Description, A Program as Components in Quasi-Parallel, and Simulation are still of great interest.

Although the reader is warned explicitly that the book is not about the language as a simulation system, the discussions of computer simulation seem particularly valuable.

Potential readers should not be deterred by the slightly old-fashioned appearance presented by parts of the book, or by the limited contemporary appeal of Simula as a programming language; this remains an important work deserving careful study.

## Focussing on Pascal

Foundations of Programming with Pascal, by Lawrie Moore. 238 pp. £14.50. Ellis Horwood Publishers.

THIS is yet another contribution to the growing number of books endeavouring to teach Pascal programming to those who have never programmed before.

It is distinguished by a remarkably thorough technical approach and a useful and imaginative selection of problems.

Basic concepts such as names,

variables and assignment are introduced in the first chapter and this is followed by detailed discussions of data representation before programs as such are introduced in chapter three.

All aspects of Pascal are introduced subsequently, including features like file processing, dynamic data structures and recursion that are often omitted from elementary texts. Backus Naur form and the Wirth syntax diagrams for Pascal are also covered.

Problems for Computer Solutions Using Fortran, by M. Walker. 230 pp. Bl. Winthrop Publishers Inc.

THIS work is based on most student use in a Fortran programming course at Grinnell College, Iowa. Part I is a general introduction to Fortran programming while Part II is devoted to discussing representative programming problems from a number of different subject areas.

The teaching method in Part I to show the student how to develop a series of programs of increasing sophistication.

Problems stemming from a large amount of detailed technical information that must be handled by ingenious typographical conventions that do not detract from the relatively simple commentary.

All features of Standard Fortran are covered.

It is a commendable achievement to have produced a lucid comprehensive presentation of Fortran with many worked examples and problems plus general remarks on programming algorithm design in under 200 pages.

Part II presents some past programming problems and sorting, progressing to and specialised problems grouped under subject.

There are sections on file programming as applied to data processing, trigonometry, algebra, statistics, chemistry and physics.

Many examples and problems are given and the level of knowledge assumed for each subject seems to be around first-year undergraduate level.

# Only nine days left to join the 'superstars' in this year's DP Olympic Games

COMPUTASTARS and Computug organiser Gordon Cairns is not a worried man; he is merely concerned that scores of potential competitors for this year's events may not realise how close is the deadline for this year's competition.

"There are only nine days to go before the closing date of February 28", Cairns explained. "So far, we have some 35 teams on register for Computastars and fewer than 10 entrants for the Computug, but this is only the tip of the iceberg."

"One interesting feature is that over 50 per cent of the Computastars entry comes from teams new to the competition. Some have even awarded themselves exotic competitive titles."

"Perhaps the most striking is from Kalamazoo, which has styled itself the Kalamazoo Superstars before a competitive event has taken place. There's an optimistic note on which to begin your first venture into Computastars!"

"Other new entries include the Cidbank Shylocks, Sandvic Vikings, Rucal, the Reed Group, Microscope and Elstree Computing."

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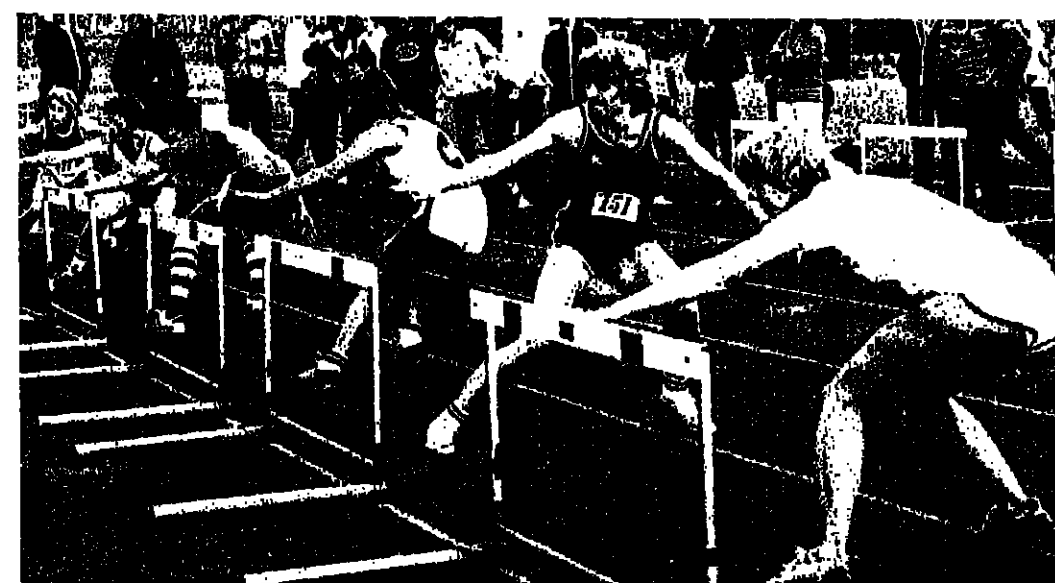
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To COMPEC North, c/o IFC Exhibitions Ltd, Surrey House, 1 Thorney Way, Sutton, Surrey SM1 4QQ. Please send me more information about exhibiting at COMPEC NORTH.

Name: \_\_\_\_\_ Company: \_\_\_\_\_ Address: \_\_\_\_\_

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Name of team(s).....

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Address .....

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Telephone No ..... Extension .....

Signature of DP manager or equivalent authority .....

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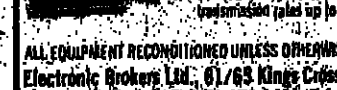
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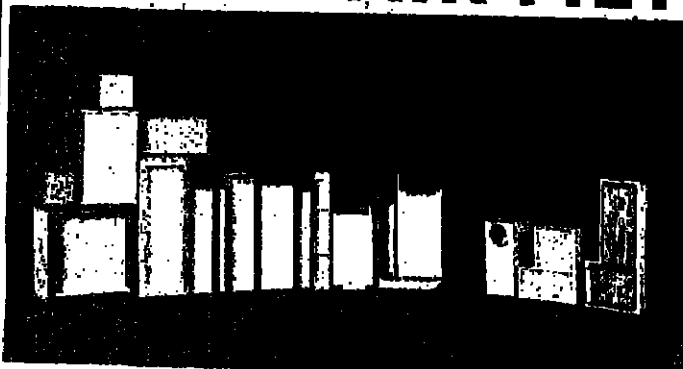
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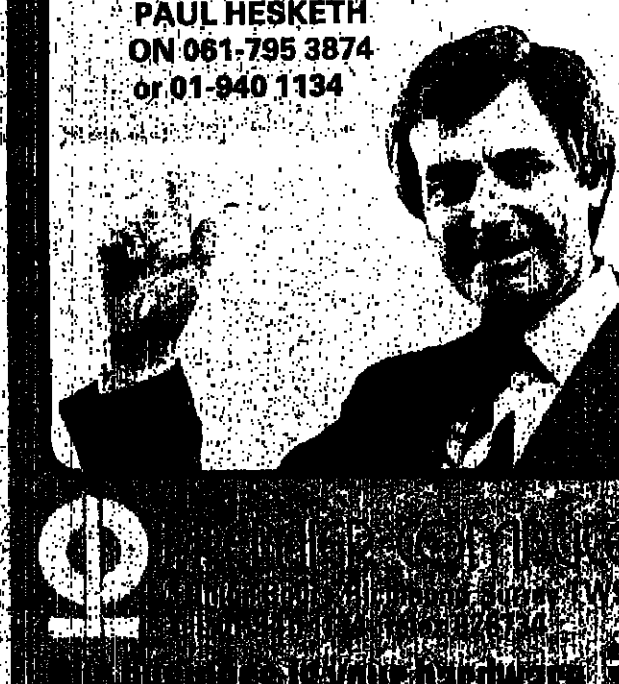
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## SOFTWARE SPECIAL - 1

Much attention is focused on software products for minis and even micros, but mainframe products still account for the

major part of overall software expenditure. This feature has points of view from ICL, Cincom and Altergo on commercial

products for mainframes, and asks an academic where recent developments could take us in the foreseeable future.

# Why all OS roads from IBM seem to go the same way

by John Ennever

IN January 1979 IBM's data processing division announced the 4300 machine series, and along with it new releases of most of the existing operating systems.

Initially sales emphasis seemed to be on one of them, the new DOS/VSE. However, over the last year many IBM customers have been pointed towards VM: either as part of the installed software or, in the case of some new users, as a total solution. It seems appropriate, then, to review the history of the IBM control programs and consider their possible futures.

When IBM introduced the 360 range the intent was to have one operating system, OS - The Operating System with three versions: PCP, MVT and MFT. There was a problem in that the smallest of them, PCP, was too large for the small end of the 360 range. So IBM in Germany wrote three smaller control programs - BOS, TOS and DOS.

These were different from OS: they had a different philosophy, different job control language, different layout of storage; in fact IBM had saddled itself with two distinct growth paths from this point on. It would mean two sets of all standard software, utilities, compilers and so on; one for OS and one for DOS. TOS and BOS users began converting to DOS and PCP users to MFT or MVT.

## Conversion

With the advent of virtual storage, new versions of the operating systems were announced: DOS/VSE and OS/VSI to replace DOS and MFT; and OS/VSE to replace MVT (announced a little later).

Several DOS users wished to upgrade their systems and operating facilities, but then found themselves faced with the difficult and expensive conversion to OS. As an aid to these customers IBM pointed to VM, developed earlier on those of the 360s capable of virtual storage.

VM has the ability of running a number of virtual machines and hence several operating systems at the same time. From the outset it was designed as an interactive system - its own built-in operating system: CMS (Conversational Monitor System) allows for the interactive development and testing of programs. However, VM was considered simply a conversion tool, or at best a convenience-for-systems programmers who might want to test a second system in isolation from the main OS or DOS machine.

As the 1970s passed, OS/VSE2 split into SVS and MVS. The IBM addressing scheme was limited to 16 megabytes, but with MVS, multiple virtual areas could be supported (something which VM had already achieved by allowing each machine a 16-megabyte address space if required).

## Upgraded

In 1979 the 4331 and 4341 machines were announced. OS/VSI was upgraded to release 7 with practically no new features. SVS was stabilised (that is, discontinued); VM was enhanced to release 6 and many enhancements to it soon followed; DOS/VSE was virtually rewritten and announced as DOS/VSE, while no support was offered for MVS on the 4300s at that time.

Since then, much has happened. SVS users have moved to MVS. OS/VSI users have had almost no new facilities offered them (in the

middle of last year some new disc support, but essentially very little else).

There is little aside from a customer's computing background, then, to attract him to VSI on a 4300 machine. The 4331s native disc, the 3310 and 3370, are not supported, the native tape drive, 8809, is not supported, and so on. It seems that IBM has little interest in developing BSI and must soon announce its demise.

## Where to go?

Then where will the users go, to DOS/VSE?

Curiously, there have been a few VSI to VSE conversions (just the reverse of what happened six or seven years ago). DOS/VSE was announced as the native 4300 operating system. VSE along with VM was announced as being easily installed under a SIPOVE (System Implementation Productivity Option Extended), a menu-driven package allowing access to the system's facilities for inexperienced users and performing system programmer tasks on the same basis.

VSE was now clearly an interactive operating system. It was "expected" that VSE users would maintain and test their source programs at terminals using the new DOS products.

VM was there, either as a standalone system or packaged with VSE, but most of the 4300 accounts still seemed to be VSE, with some VSI on the more powerful 4341.

Not until the announcement of the fourth machine in the 4300 series, the 4341-2, was MVS supported in the range. The smaller 4331s (there were two models now) both fell below the capacity needed for MVS, but IBM felt that both 4341 models were powerful enough.

Meanwhile, early VSE users had had some problems. The SIPOVE installation aid had many flaws and the interactive system ICCF seemed to use an unusually large amount of CPU time. A change seems to have occurred in marketing aims and the advantages of VM were being extolled.

VM, has changed over the years and is now much enhanced. Without a guest operating system (VSI, VSE or MVS) it is possible to run most OS or DOS program products. It is CMS which gives VM this facility, and a user may change his machine from one environment to the other with a single command.

Why, then, leave any operating system other than CMS? CMS offers all the facilities of the operating systems on an interactive basis as it was designed to do. In 1980, VM/SP was released. SP (the System Product) is installed on top of a VM base and gives a much enhanced system. For example, the system Editor, XEDIT, replaces (and is superior to) its predecessor EDGAR; the macro language is much improved; all new devices are supported, and SNA facilities are provided.

What is missing, is the ability to run CICS programs directly under CMS. CICS is IBM's terminal monitor system which runs in OS and DOS configurations.

In fact, the product DMS/CICS, which allows the user to define his CICS sessions easily, has its counterpart in DMS/CMS. It seems VM is enhanced, ready and waiting for users to convert to it.

VSI users may have to choose between upgrading their machine power to cope with MVS, converting to VM, or staying with a stable system. At many 360/DOS

users have done over the last few years.

DOS/VSE users might be attracted to VM, for the efficiency of CMS and its lower CPU overhead for development functions. There is no doubt also that VM/CMS is by far the easiest of the IBM operating systems to use and learn.

Several new users are already using VM/CMS as their only operating environment and there are indications that IBM expects that if VSE or MVS are to be used, they will be slaves in a virtual machine. For example, DOS/VSE has been enhanced so that it runs without address translation under VM. The 4341 allows both MVS and VM microcode assists to coexist in the machine. (Why offer such a facility if MVS is not expected to run in a VM system?)

For IBM, a move to VM would provide an answer to competitors' interactive control programs, and would take the ground from under the plug compatible software suppliers' feet.

To the user, too, the adoption of VM makes sense. CMS is the ideal type of program development tool.

How will IBM achieve the establishment of one operating system which will run on all its 370, 3030 and 4300 machines, and which system will it choose? Only VM is currently supported throughout the range; only VM has the ability to absorb any features of DOS and OS, that customer demand may continue; only VM meets the current state of the art for control programs and could be correctly termed a Hypervisor. Where must DOS users turn if they exceed 12



John Ennever is principal lecturer for Altergo Education. He joined the company three years ago as a specialist in PL/I and has worked and taught on all IBM large system operating control programs. He is currently developing educational courses based on VM/SP. Altergo runs three IBM 4331 processors each with a different operating system.

partitions or 16-megabyte virtual storage? VM!

Another pointer recently was the rumour that the operating environment for the top of the range IBM machine, the 3081, is likely to be VM in nature. And lastly, the only operating system capable of easing the conversion to one system is VM, which can provide the old facilities alongside the new. No user with any of IBM's data processing division machines can

ignore the development of VM by IBM.

Nor should users be unaware of the grip that this move may give IBM on software revenues. The 4331 with an adaptor based hardware has drawn many first time users to IBM peripherals. It is likely that a move to VM may do the same with software, and enable IBM to control software revenue more closely than it has done in the past.

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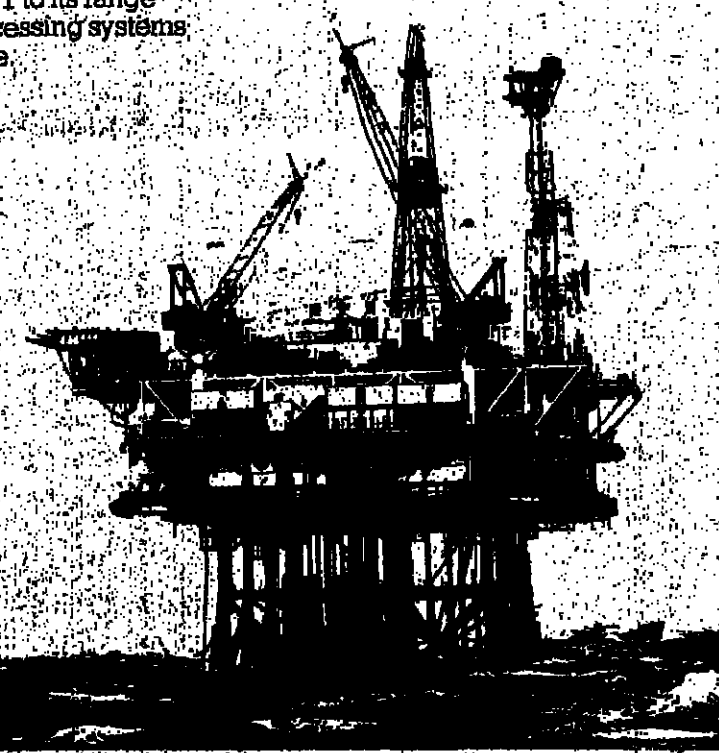
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# Making case for software's independent suppliers

by Terry Booth

AT its annual Million Dollar Awards ceremony in April 1980, International Computer Programs recognised 432 software products as having exceeded \$1m in gross sales. Many of the products from independent software suppliers had achieved milestones in gross sales of 20, 30 and 50 million dollars with the top award of \$100m going to Cincom's Total Data Base Management System. In 1971 only 29 software products had achieved the \$1m distinction.

The prime case for independent software suppliers is that without them the data processing industry would not have had a range of tools to exploit fully the continuous breakthroughs in the price/performance of computer hardware.

In the Sixties and early Seventies the single supplier concept of acquiring the computer, its peripherals, terminals and software was considered a *raison d'être* for data processing managers everywhere to look to their hardware salesmen for the provision of the entire box of tricks.

One can understand, to a degree, that earlier philosophy. However, many of today's software decisions, like other investment decisions, must be substantiated by appropriate cost/benefit appraisals and return on investment justification.

With software becoming accepted as a more important investment than the hardware itself there is a swing away from the earlier belief of having one general purpose computer supplier to the healthier trend of using specialist software houses to provide specialist business solutions.

There are several other reasons for this movement away from the single supplier attitude, not least the increased pressure on DP management to deliver computer applications.

## Risk

The data processing executive is more accountable than ever to fulfill his project commitments and contribute to the needs of his employer's business. No longer can he merely afford to take the application software package available from the hardware manufacturer if it means having to tailor and change established company methods and procedures to shoehorn the implementation into unsuspecting end user departments. The risk is too great, particularly when he knows that somewhere within the industry the right package for his company almost certainly does exist. In addition, there is an increasing trend by users of IBM, ICL and other computers to seek out and buy high quality system software from independent suppliers specifically in the areas of database management, data communications and application productivity tools.

This has produced a bandwagon effect. Independents are now seen as legitimate business partners; the old single supplier arguments of the computer manufacturer are no longer the emotional sales obstacles they used to be.

Between 1970 and 1980 computer hardware price/performance improved by a factor in excess of 200:1 (RPI adjusted). During the same period we have seen huge increases in people costs at all

levels of a computer installation. It is inevitable that computer users will demand new ideas and techniques to improve productivity in all aspects of their business, not merely with marginal benefits that most software producers have achieved to date, but with completely rethought methodologies to replace many of the sacred cows that have been with us for 20 years or more.

For example, so-called high level languages like Cobol and PL/I were conceived three generations of hardware ago and provide little comfort to the new breed of computer end users.

## True value

To appreciate fully the value of the independent software products one has to appreciate also the true value of software itself. The media in the computer industry still pursue their love affair with the hardware business with only a passing fascination with the software industry. Within the next five years software will be accorded its true recognition as the most important entity in the data processing league table. When using the term software I am naturally including the application code within that definition.

Whereas at one time commercial data processing was oriented towards automated clerical tasks and presenting history information, it has matured in many instances into accepting the key role of providing operational control systems within the organisation.

The value of such operational control systems should be viewed in context with the current economic climate where a company's competitiveness and service come under closer scrutiny than ever before.

"The organisation which has the best computer system for controlling its business has a distinct competitive edge" may have seemed like a naive statement in previous years, but no longer does industry doubt the validity of that statement. Putting to one side the current popular notion of "survival" as the top priority in a list of business objectives, the real objective of those that do survive is to maximise profitability. If one can accept the argument that increased profitability comes from increased productivity then software can help dramatically to achieve that objective. Operational control systems are really fundamental to an organisation's success. They must be built in realistic time scales; they must be changeable; and they must reflect the true needs of the business as seen by the commercial management. However, the growth of the independent software product business is built almost entirely on the fact that hardware suppliers like ICL and IBM and others have failed in so many areas to provide such help in the form of software tools, productivity aids and software packages to help the hapless end user.

Among his other many pressures the data processing manager has to contend with the knowledge that executives in most level of expectation from their data processing departments than, say, five years ago. The management of company areas not traditionally associated with data processing are

increasingly looking to the computer for help with specialised applications and personal computing. Even the most competent hardware supplier would be hard-pressed to provide a software solution for every situation. Thousands of computer installations have acquired products from independent software houses simply because the desired facilities have not been available from their hardware vendor.

The independent supplier of software is seeking only to sell his software product as a means of meeting his clients' needs, often offering compatibility across different manufacturers' hardware and operating systems. The hardware supplier typically has multiple objectives which include maintaining hardware loyalty and if possible generating further demand for additional hardware.

Whereas independent suppliers of system software are aiming towards providing software portability among different hardware manufacturers, the manufacturers themselves have quite a different objective, that of "locking in" the client to the hardware manufacturer and in some cases, to a particular range of equipment.

Even those areas where some

manufacturers have adopted the industry common approach to product development such as a Cobol database management system they will find that their standardisation claims are not justified. The Codasyl committee may have provided a common set of rules but sadly these rules have been interpreted and implemented differently in most versions. It is not become a standard, it is not portable and in any event has achieved a popular level of acceptability.

## Come of age

The independent software sector has done much to further the cause of cost effective computer data processing. Having such life as a cottage industry in the 1960s on the back of the computer revolution the software industry has long since come of age. It continues to strengthen and grow for as long as discerning computer users demand alternative solutions to those provided by their computer supplier.

In a free marketplace such competition is no bad thing and provides a major benefit to the community.



Terry Booth, UK general manager of Cincom Systems, puts the case for independent software suppliers. Cincom has products for database management, data communications, manufacturing systems and consultants.

# The juggernaut rolls on to new and yet more complicated languages

by Tony Davis

THE computer world, especially its academic side, shows no sign of stopping its juggernaut progress towards developing new and yet more complicated languages.

Everyone has a favourite language and the less conservative among us spend much perhaps fruitless time trying to persuade others that our own particular choice should supplant Fortran and Cobol. The trouble is that each language has its quirks, including the two named.

Languages can be classified in a number of ways - for instance, by the data types of the objects they can handle. I classify languages qualitatively into those which have evolved and those that have arrived suddenly by revolution.

Fortran, Cobol and Basic fall into the first category. The process of evolution involves taking a language as it stands and grafting new features to it.

Fortran has encompassed three main stages to date which are sometimes known as Basic Fortran, Fortran, and Fortran 77 and each of these has had an ANSI standard.

## Originators

Basic Fortran was in its day perhaps the biggest revolution of all. We shall see below that one of Fortran's chief originators, J. Backus, is still being a revolutionary. Cobol has gone through at least four standards in 1961, 1964, 1965 and 1974.

Basic, too, has had standard versions (at least six "editions") imposed on it by Dartmouth College where the language originated - but no-one takes any notice of those.

I should imagine that there are nearly as many versions of Basic as there are operating systems - indeed some systems give access to more than one version of Basic - and nearly all these versions are incompatible with one another.

Even Pascal, that darling of with-it personal computer buffs, is going to be standardised eventually. Its originator, N. Wirth, and his collaborator wrote such a standard in 1974 soon after the language had appeared on the scene in 1971 and after a revised report had been issued in 1972.

A version called UCSD Pascal has practically become a standard in much of the computing community. It seems to me that when a language evolves to a stage where it needs a new standard, the previous drafts it has undergone have not been well thought out, or the root stock is rotten in the first place.

The revolutionary category is somewhat smaller and includes APL, Algol 60 and Algol 68. These have standards imposed by their originators.

They did evolve, but mainly at the research stage and only after much heart-searching by their theoretically-motivated designers.

It is true that both Algols had revised "standard" reports besides originals but these were to clear up minor points.

It is a little difficult to say to which class PL/I belongs. It seems to be evolutionary in the sense that it has taken "features" from just about any other language its designers fancied.

However, it did appear more or less in one chunk. It enjoyed the advantage of having the monolithic might of IBM behind it as a standardising influence.

## Revolution

Ada is too young to be viewed properly in perspective. An initial impression is that it stands in the same relation to Pascal as PL/I does to Fortran and it too seems to consist of a large number of ill-considered features.

None of the languages popular today is perfect, especially as a universal medium. It seems that a new language is invented when someone gets dissatisfied with an old one because it is not doing its job properly or because a new feature (such as block structure) has been introduced.

When this happens, we should go back to the beginning and start a revolution; we should not just tack some sticking plaster over the cracks of something basically flawed.

Users with heavy investment in already existing software are bound to disagree but this article is not an argument for getting rid of current compilers and the software written for them. We must encourage users constantly to try out new languages and operating systems with the long-term objective that they may be able to produce better software with a higher probability of being correct and with less programmer effort. This will pay off handsomely in the end.

When the St Andrews University department made the change from Fortran to Algol, the amount of terminal time used by students went down initially in a dramatic fashion. We were worried that students were not carrying out their projects properly.

On investigation we found that they were getting them correct in a much shorter time and with many fewer Edit-Compile-Run cycles. Every language has its quirks which are introduced either consciously or unconsciously by the language designers.

One question which springs to mind is whether it is sensible that a mathematician user and an information retrieval user should use the same language.

There must be features useful to one but not the other and it is absurd that these should then both be built into a common language unless they are both of genuine use to both classes of programmer.

A language with features stuck on in this way has been described

as "baroque" by Dijkstra. It would appear sensible that we should immediately consider how to reflect the new kinds of thought processes that are involved when a new approach to computers comes along.

Some time ago, computer scientists started thinking about a different way of formulating algorithms. Our whole outlook has been geared historically to the von Neumann view of a computer - as a store, a CPU, and a narrow "bottleneck" connecting them.

This concept of a bottleneck is from an illuminating paper by Backus, presented on his being given the Turing Award by the ACM in 1977.

Backus points out that "the task of a program is to change the contents of the store in some major way... by pumping single words back and forth through the von Neumann bottleneck..."

All this leads us to think about the separation of program entities

into, on the one hand, commands which modify the store via the bottleneck, and, on the other, expressions which are merely descriptive, provided they don't have side effects which can only happen if some other command is embedded into them.

It suggests a type of completely definitional method of programming where data structures are described rather than computed by a series of commands.

This kind of programming is known as applicative or functional programming because the data structures are described by applying functions to other data structures.

Because such expressions are totally free of side effects they can be computed in any order and in particular parallel execution can come into its own.

Consider the expression:  
complicatedexpr1  
+ complicatedexpr2  
Provided that the complicated

expressions are guaranteed not to have any side effects, they can be evaluated in parallel or in any order that suits the efficiency of the controlling system.

Languages are needed in which the entities involved are pure expressions and a number of applicative languages are being and have been developed. They turn out to be powerful and concise.

One particular example, SASL<sup>4</sup> (St Andrews Static Language) is so succinct that its syntax can be defined on half a quarto page which makes it easy to use.

## Inefficiency

Its notable lack of features and orthogonal nature make it pleasant to program in, though newcomers from conventional programming find it a little strange at first.

We are now entering a stage where actual non-von Neumann hardware is being researched and built to implement these lan-

guages. Until recently, such machines had to be modelled on von Neumann hardware and were painfully inefficient. It is my contention that we will not stop developing languages tomorrow, and getting the design of a language right is fundamental to the way a whole community of programmers has to work.

<sup>1</sup> "Pascal User Manual and Report" K. Jensen and N. Wirth. Springer Verlag 1974.

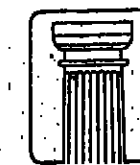
<sup>2</sup> "The Humble Programmer" E. W. Dijkstra. Communications of the ACM, Vol. 15 No. 10.

<sup>3</sup> "Can Programming Be Liberated from the von Neumann Style? A Functional Style and Its Algebra of Programs", J. Backus. Communications of the ACM, Vol. 21 No. 6.

<sup>4</sup> "SASL: Language Manual", D. A. Turner. University of St Andrews Department of Computational Science Report CS75/1.

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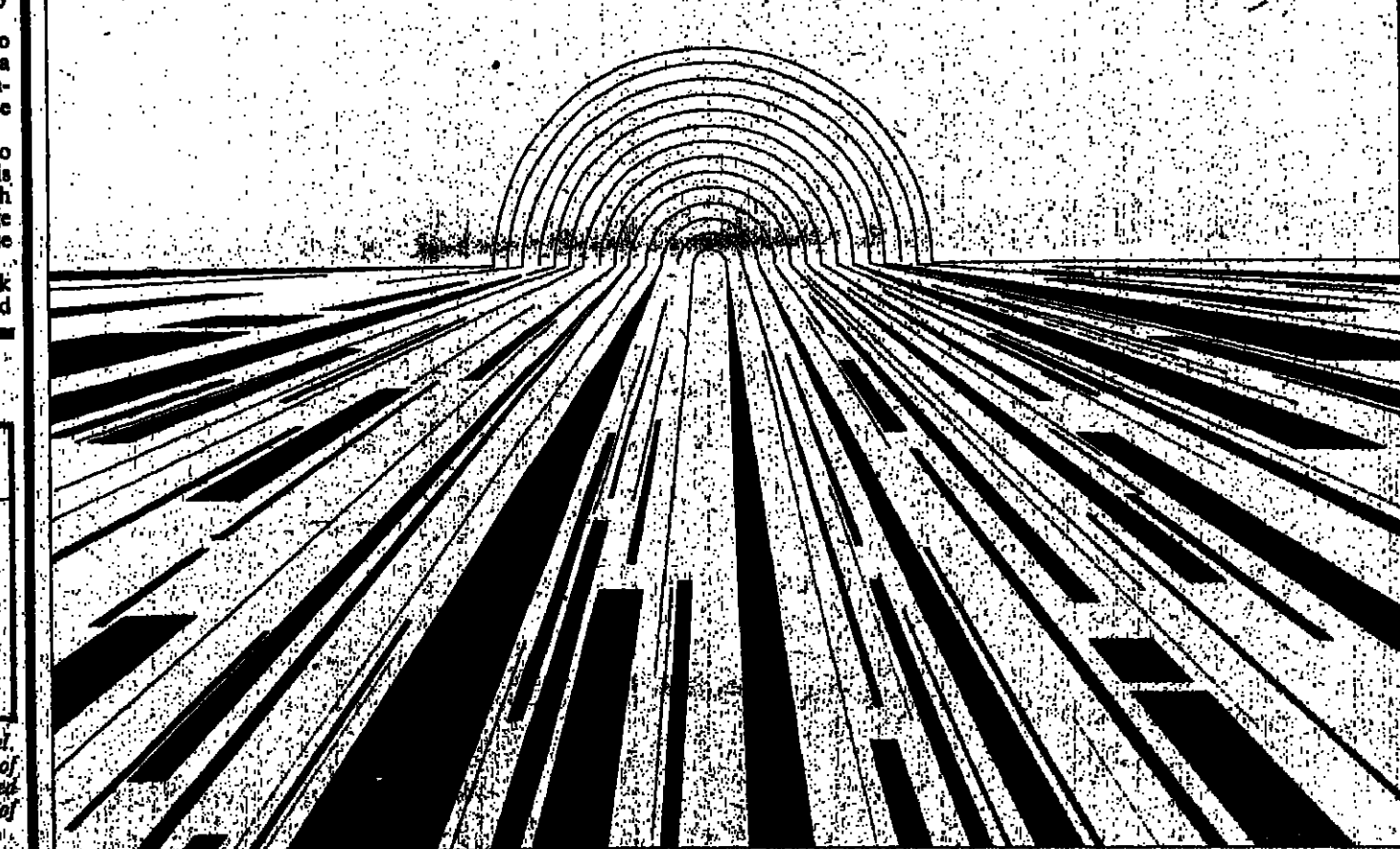
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Informatica	US	2.3	Informatica	7
Altrac	UK	1.8	ADV/Orga	5.38
NCP	UK	1.8	Altrac	5.12
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# Looking towards the coming together of relational and Codasyl

by Graham Brown  
ICL's connection with database software came about through its involvement in manufacturing industry. Database software developed primarily in response to the "parts explosion" problem and other complications involved in translating requirements for finished assemblies into components and shop floor operations needed to make them.

This was how NIMMS and PLUTO were developed for 1900. Similarly, DBMS was developed for System 4. These were sound products in their time and taught some important lessons. One was that the whole software development process could be expedited by means of a database. This is how ICL came to appreciate the need for a data dictionary-system oriented to the needs of the system designer - a more demanding re-

quirement than a mere aid to file rationalisation and tidying. There was a debate during the 1970s between the relational and Codasyl approaches to database backed by the academic community on the one hand and the data processing world on the other. The issue was between simplicity and support of query languages versus the need for systems which could be tuned readily to give acceptable performances.

## Productivity

There was a good deal of emphasis on managerial benefits of data integration in a database as a means of securing greater overall control of the organisation. With the passage of time more modest objectives have emerged. These are of direct benefit to the data processing department. The

real benefits are seen today in terms of increased programmer productivity together with the ability to provide many access paths. Although organisation-wide integration has proved unmanageable, integration over substantial groups of applications has been possible.

ICL has been involved in both the relational and Codasyl approaches. Just after 2900 series design began in 1971, ICL joined the Codasyl committee and contributed to their specifications. These became an important input to the data management architecture for the series.

A top-down approach was adopted to the provision of a range of data management system products. At the highest level, there is a data dictionary system. This is an invaluable tool for

designing any organisation's data processing - whether by hand or computer, batch- or transaction-based. It can be regarded as a meta-database, describing other databases and the associated procedures.

## Documentation

DDS has also established its value as a general data administration tool for system designers and for business administrators and it has over 100 current users.

In the IDMS context, DDS provides the means of generating the schemas defining database structure and the subschemas which interface Cobol and Fortran programs to the database.

DDS also provides documentation for the system and the business in which the system is embedded. For the future, ICL

intends to support many of its system products by IDMS, which provides a framework for the development of all forms of information processing.

Below this level there are two main products, IDMS and TPMS. These have been designed to work together using straightforward interfaces so that the application programs running in the Transaction Processing Management System can easily access the IDMS database.

## Development

IDMS is the Integrated Data Management System which ICL acquired from Cullinane Corp in 1975. At that time, it had laid the foundations for what has since become a formidable reputation in the database field.

IDMS allows records to be stored within a network structure that offers the most general method of data representation, allowing the database structure to reflect that of the application. It also provides an independent means whereby the user can control records so as to optimise placement and two alternative placement modes are provided.

One uses a randomising algorithm analogous to the "hashed random" access method and the other allows records to be placed as close as possible to a preferred set owner in the database structure.

The Cobol programmers interface to the database structure and access to records from his program are in the form of extensions to Cobol in the Codasyl style.

The TPMS user can use this mechanism, specifying the details of the database he is to access by means of parameters in his TP

Graham Brown with ICL's product design team. In this section traces his company's involvement in database software and reviews its commitment to both the relational and Codasyl approaches which are for ICL, "essentially complementary".

parameter file. TPMS can alter the necessary IDMS definition for him. The most recent addition to ICL's database products is the Personal Data System. It is a relational database system on a Southampton University project, enable many more people to use databases without the help of experts.

His system exploits the principles to provide a means of manipulating data in a form directly accessible to people's ordinary day-to-day data.

Another internal development, ICL has been the system CAPS to the implementation of high performance relational base.

It is in regular use in personnel records and company data. It points the way in which microelectronic processing of retrieval enables the flexible retrieval approach to be provided to high performance systems.

At present, ICL's Codasyl relational systems are complementary. Codasyl is a high performance database facilities to support the shared online and batch relational systems and to use data bases with support for query languages.

Future requirements in distributed database systems are being met by the development of hardware development facilities to the systems to compiling the structure and of database systems to be specified without compromise of performance.

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### Programmers IBM 370 and 4331

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A finance company in Middlesex urgently require IBM Programmers to complement their existing team. A minimum of 6 months' experience is required although candidates will preferably have some 2 years. In either case experience of CICS is essential. A knowledge of DLI and financial applications would be advantageous. In return they offer salaries of £9,000 together with a bonus, free BUPA, non-contributory pension and life assurance and luncheon vouchers. D.4929

### Analysts and Programmers ICL 2900

**SURREY** to £9,000  
A leading insurance company in a pleasant Surrey environment seeks both Analysts and Programmers for their 2900 machines. Applicants should have a wide knowledge of 2900 machinery with preferably experience of insurance or pension applications. Salaries of up to £9,000 are supplemented by a wide variety of financial benefits which includes a mortgage subsidy after an introductory period. The situation is within 3 minutes of the main-line station. D.4654

### Programmers ICL 2900 and IBM CICS

**CENTRAL LONDON** to £8,000 + BONUS  
Our clients are a fast expanding software house in the West End. They need COBOL programmers for both ICL and IBM machinery for a variety of projects. Candidates should have a degree or its equivalent and between 1 and 4 years' experience of either or both of 2900 and IBM CICS. Knowledge of PLAN will be useful. Salaries of up to £8,000 are offered with a realistic chance of an additional £1,000 bonus. The above vacancies are only a small selection from those currently on our files and we are always delighted to talk to experienced systems and programming staff wishing to further their careers. 1462

Datascene International Limited,  
Sceptre House,  
189-173 Regent Street,  
London W1R 7FB. Tel: 28851

01-439 7871  
24 hour answer phone

# MODUS

Modus Management Services Ltd  
148 Watling Street, Radlett,  
Hertfordshire, WD7 7JH

## International Personnel Consultants

Telephone: Radlett (09276) 3077

# CSC

COMPUTER SCIENCES COMPANY

Computer Sciences, now in its twentieth year of operation, is the largest hardware independent information sciences company in the world.

The services CSC provides cover every aspect of computer technology: from requirements analysis to the design and implementation of large real-time information systems (particularly command and control); from the design and development of many different compilers to the development of complete operating systems for a number of computers; to the design of data communications networks.

The company has personnel resources of over 15,000 employees located in over 100 offices worldwide and also owns its own remote processing service, INFONET.

CSC UK was formed in 1969 and is perhaps best known for the development of large projects such as the London Airport EDP Scheme (LACES) and the Royal Navy's Command, Control and Information System (OPCON).

Towards the end of last year the company was awarded a number of similar projects, as a result of which several extremely interesting and challenging positions have been created. These are urgently required to be filled and applications are therefore invited from candidates who feel they fit one of the following categories: —

## Systems Design Consultants £11,500-£17,000 depending on experience

The salary range above clearly indicates that these positions offer tremendous scope to good people. We will expect to see extensive large systems design experience, thorough understanding of how database and on-line systems are built and co-ordinated and — most importantly — evidence of being capable of working from the higher conceptual levels down to detailed design, on large projects.

At least one of the positions available requires extensive knowledge of ICL 2900 hardware and IDMS and associated software, whilst Data Analysis (or similar) skills are essential from all candidates.

## Comms Software Designers £10,000-£13,500 depending on experience

We seek talented senior team members, people who can conceive and design networks incorporating packet switching, voice and data, transmission etc. etc. Software expertise is a vital ingredient in the equation, so experience of software modelling, software package enhancement or amendments must be present.

An important point to note is that pure specialists in comms or telecomms will not be suitable. Certainly communications knowledge is of primary importance but individuals must have a broad and comprehensive view of systems design and therefore be capable of ensuring that the communications side of a large distributed system is properly designed and implemented.

The quoted salaries are at the top end of the normally available 'market rates' and reflect the fact that CSC is a highly professional and reputable company. Naturally, benefits are in line with this and include BUPA, company pension scheme and a car leasing scheme for senior staff. Season ticket loans are also available and are interest free and relocation expenses can be made available if appropriate.

Contact: Andy Wright or Mike Creamer at Modus  
or K. R. Barge on 01-439 4511

Staff no 1110



# FOR A TOP JOB IN DATA PROCESSING YOU ONLY HAVE TO KNOW WHO TO ASK!

Ever had the feeling that your career is slipping from under you? (No doubt you put it down to the current ice-age of recession.) Well, in one deft move, you could find yourself back in an environment of certainty, growth – and future. You could also find yourself earning up to £15,000 and a car!

Get in touch with Hambro Life.

But first of all you should know a thing or two about us:

The Company began operating in 1971, and by the end of that year assets totalled around £30 million. From the start, we were totally committed to computerised systems.

Result in 1981:

Hambro Life is the largest unit-linked assurance company in the U.K., with assets in excess of £1.1 billion. In fact, in 1980 we notched up a phenomenal growth in assets of 28%.

Our integrated systems have now entered Phase 3, while the current configuration is a 3033N (4MB) and a 3031.

From this you may assume that our Data Processing Division is very large, very exciting, full of career potential – right to the top. Your progress and rewards are based on your performance. The company itself is young with an average age of 28 in the Programming Department.

So if that gives you some idea of why Hambro Life is the company to work for, we can now move on to your job.

We need to expand our technology based areas with talented people who have a proven track record of excellence and potential to grow.

**HAMBRO LIFE**  
**THRIVING NOT SURVIVING**

The areas of expertise that interest us include:

IMS DB/DC software  
database and data administration  
computer systems design especially on-line systems  
hardware capacity planning and management  
DP training and career development planning  
project management  
people management

We pride ourselves on effectively utilising the expertise each individual offers and on building jobs around that expertise – providing career prospects for all our people in every area of D.P.

We will be offering jobs at two levels:

Jobs like Chief Technical Designer and Chief Programmer offer starting salaries up to £15,000 plus a company car with all running expenses. For Senior Technical Designers and Senior Programming Consultants, salaries will be up to £13,000 plus company car and all running expenses. The D.P. Divisional Trainer we need could be at either level.

In addition to these top salaries, we are also offering a non-contributory pension, free life cover, profit sharing scheme, BUPA, and a generous relocation package for your move to Wiltshire.

For full details and an application form, either send the relevant coupon to Anita Meech, at Hambro Life Assurance Limited, Hambro Life Centre, Station Road, Swindon, Wiltshire or call her on Swindon (0793) 27812 (24 hour Ansaphone service).

I'VE HEARD  
PROGRAMMING IS DIFFERENT  
AT HAMBRO LIFE. TELL ME HOW MUCH?

NAME

ADDRESS

I LIKE PEOPLE AS  
MUCH AS PROGRAMMING –  
COULD I BE YOUR D.P. TRAINER?

NAME

ADDRESS

I'M AN IMS EXPERT.  
WHAT HAS HAMBRO GOT TO  
OFFER TECHNICAL SPECIALISTS?

NAME

ADDRESS

I'M GOOD AT  
DESIGNING COMPUTER  
SYSTEMS AND I'M ASKING...

NAME

ADDRESS

## MYRIAD

### BUSINESS SYSTEMS ANALYST

INTERNATIONAL PAYROLL & PERSONNEL SYSTEMS

BASED LONDON W6

TO £13,500

A highly successful engineering construction organisation now wish to recruit a Business Analyst to join the development of a major new project co-ordinating multinational requirements.

The person appointed will become a key member of a broad based project team and will be the computing specialist in the areas of Payroll and Personnel applications.

The International nature of the project dictates that the person will need to be mature and capable of consultation and liaison with Senior User Management in the U.K. and overseas offices, to ensure the successful co-ordination of development and implementation of the system.

Candidates will be required to offer substantial relevant applications experience in addition to a successful background of data processing project development. The role will require the person to develop the business specifications for the U.K. and overseas locations and thence travel to the U.S.A. for a short period to help produce the corporate systems specification. Subsequent short term travel may be required to implement the system.

Data Processing plays a major part in the business activities of the company and therefore career prospects in both the U.K. and overseas are very attractive. An excellent range of employee benefits are offered in addition to the very competitive commencing salary.

REF: NW1/1902

#### SYSTEMS ANALYSTS PROGRAMMERS

£8,500-£10,500  
£7,000-£9,000

##### HANTS

Our client requires both Programmers and Systems Analysts for their main Computer Centre servicing user requirements throughout the U.K. Developing systems for financially based applications offers job interest and the opportunity of working on IBM 4300 equipment using CICS for on-line systems development.

**SYSTEMS ANALYSTS:** Must have been involved in the design, specification and successful implementation of a significant commercial project and be able to relate confidently to user personnel.

**and PROGRAMMERS:** Will need to display a professional approach in developing COBOL or ASSEMBLER programs and have the drive to move into a user contact role.

Our CLIENTS can offer a technically stimulating environment using some of the most up to date computing facilities available. A full range of benefits including relocation assistance support these opportunities in an environment where personal contribution is recognised in a progressive installation.

Ref: RS 1902/1

#### ANALYSTS & PROGRAMMERS

##### BERKSHIRE

£7,000-£11,500

Our client is seeking additional systems and programming personnel to join and enhance their development teams working on a full range of new systems covering marketing, financial and production applications.

The installation uses IBM hardware with database and on-line systems. Experience of a similar environment will be advantageous although in some positions this is not imperative.

The successful candidates will be offered the opportunity to work in pleasant surroundings in an interesting environment using the latest IBM hardware and software techniques. Career development is encouraged and full technical training will be provided where necessary.

Telephone Myriad on 01-353 0981 to discuss these positions in detail.

Ref: HN2/1902/CW

#### MYRIAD APPOINTMENTS

30 Fleet Street London EC4Y 1AA Telephone 01-353 0981 24 hours

### COULD YOU BE A RECRUITMENT CONSULTANT?

CITY

£7,500-£9,000

We wish to appoint an additional two recruitment consultants within the Myriad organisation following the expansion of our City office.

Applicants will be interested in business matters; keen to develop management skills in a position offering job satisfaction, high rewards and the opportunity of developing personality and expertise in the computer industry. Dealing with people, developing relationships and understanding client requirements will be a major aspect of the work, involving communications and computing skills.

Under 27 years of age you should be well-educated with either programming or analysis experience gained in a commercial environment. An awareness of business gained in a Contract role would be particularly relevant. In addition to a confident and outwardgoing personality the ability to work on your own initiative is a key requirement and the potential to grow with the company is of prime importance.

These positions offer a first year salary in the range £7,500-£9,000 and substantially higher rewards will be achievable following comprehensive training during the first year of appointment. The Company offers a professional approach to computing issues resulting in a high competitive spirit and united commitment to growth.

Ref: AW1/1902

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## Holland

A highly respected Systems Consultancy based in Holland requires experienced Dutch-speaking personnel to maintain and develop new business. This successful Company which is part of one of the world's largest independent computer systems consultancies, has a solid and reputable client base covering all aspects of computing. They are interested in attracting the following personnel:

- (1) Senior Systems Analyst/Project Leader with ten years in commercial computing. Experience in Database System and Cobol is essential.
- (2) Senior Database Consultant must have in-depth expertise of

Database Development (preferably I.D.M.S.) and ON-LINE applications.

- (3) Senior Analyst 6-10 years' commercial design encompassing Database Systems and Cobol.
- (4) Programmer/Analyst, with a solid Cobol background with exposure to Transaction Processing and Database Systems.

It is important that applicants are adaptable, articulate, neat in presentation and possess a high degree of technical competence. This is a highly reputable organisation implementing top level management for many years. For further details please contact Eddie Howard.

## Mini Based High Technology Software Engineering Hertfordshire

Automation Systems, part of Kent Process Ltd., are a young dynamic company specialising in computer based Process Control and Telemetry systems. Based in Hitchin, Hertfordshire, with customers throughout the world, they are continuing to develop their sophisticated range of systems and consequently require additional key personnel with experience in any of the following areas:

- ★ Real-time Applications.
- ★ Technical/Systems Programming.

This is an excellent opportunity to team up with a highly successful company who are still young enough to recognise and appreciate dedication and determination. Career opportunities are excellent offering variety and scope on projects in the UK and overseas.

For further information please contact Eddie Howard.

## Edmund Howard & Partners

5 Brighton Road, Surbiton, Surrey, England. Tel: 01 399 9183

## Avionics — Scientific Programmers

LONDON/HOME COUNTIES/SOUTH  
SALARIES £6,000-£12,000

We have a large number of openings for people with scientific or avionics expertise. These opportunities are wide and varied and some involve a proportion of overseas travel. Candidates should hold a degree in a scientific discipline and have experience in some of the following areas:

SOFTWARE DESIGN ★  
REAL TIME MINI/MICRO SYSTEMS ★  
AVIONICS AND DEFENCE SYSTEMS ★  
ASSEMBLY

LEVEL LANGUAGES ★  
FLIGHT SIMULATION ★  
MATHEMATICAL MODELLING.

These appointments are placed throughout the above locations and all are with reputable established companies. In some cases a company car is provided.

For further details please contact Eddie Howard.

## Systems Programmers and Technical Authors UK and Overseas

Here is an excellent opportunity for technically minded individuals with an interest in either systems programming or technical writing. A leading computer manufacturer is now recruiting additional personnel to meet the demands of a rapidly expanding section of the industry. PROGRAMMERS with a minimum of two years' technical experience will be involved in a variety of projects ranging from software design and development through to final testing and implementation prior to general release.

TECHNICAL AUTHORS with some previous experience in the production of technical specifications and software manuals will be required to work in close association with both software design and product test teams. Applicants should be prepared to tackle and solve all manner of problems and maintain a high standard of documentation at every stage. Rapid career advancement is envisaged for those with the right background, qualities and experience. For further information please contact Eddie Howard.

## D.P. Consultants

Central London to £15,000 + car

Our client, a prestigious, international management consultancy, wishes to appoint additional Data Processing Consultants for a variety of U.K. and overseas assignments.

Successful applicants will be given the opportunity to broaden their experience by working with senior management on strategic and operational problems over a range of applications, both in U.K. and overseas.

Ideally you will have a good degree, at least 5 years mixed user and technical experience to include programming, analysis, design and installation. Applications experience should include some of the following: order processing, stock control, accounting, production control, banking, insurance and system audit.

Personal qualities of manner, appearance, disposition and communications skills are vital. The preferred age is between 27 and 35 years. Company benefits, including overseas allowances, are generous.

## Applications Consultant

Business Systems Home Counties Border £10,000 + car

Our client, a major international supplier of office computer systems, is expanding its support organisation. The Applications Consultant will be responsible for a team of analysts providing a range of pre and post sales support to clients in the U.K. The successful candidate will have a commercial programming background with good client liaison skills.

Applications Analysts £8,000 + car

Reporting to the above consultant, you will be involved in providing support for client applications on a growing range of sophisticated electronic office products. You will have 2 or 3 years experience in commercial programming and a healthy attitude to job flexibility and ambition.

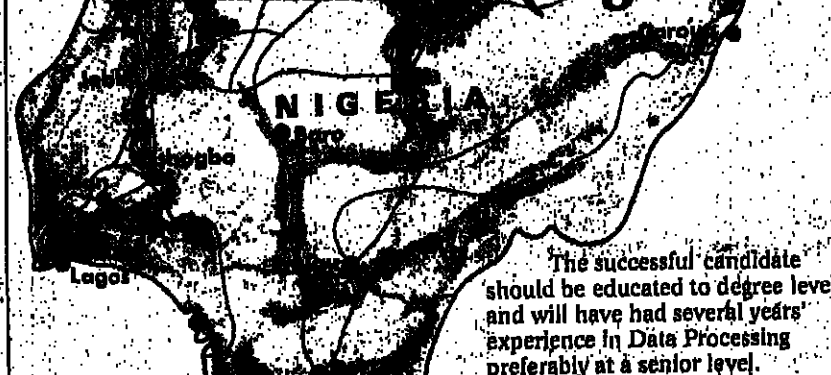
You could not fail to be impressed by the company's range and quality of products.

Apply in confidence to Terry Harvey by sending personal and career details, or contact him for an application form: evenings Gt. Missenden (02406) 4705 or daytime as below.

**HR** Harvey Recruitment  
Executive and Computing Personnel Consultants  
500 Chesham House, 150 Regent Street,  
London W1R 5JA. Tel: 01-734 5351

## DATA PROCESSING MANAGER

Raleigh Industries (Nigeria) Ltd



A vacancy exists for a suitably qualified Nigerian National to take over the operations and further systems development in an established Data Processing department using an NCR 5270 computer.

The position is based in Northern Nigeria at the modern manufacturing plant of Raleigh Industries (Nigeria) Ltd. The Department provides Data Processing and O & M Services to all operating divisions of the Company.

The successful candidate should be educated to degree level and will have had several years' experience in Data Processing preferably at a senior level.

The remuneration package will be attractive and dependent on experience and qualifications.

Please write to Mr. G. Warby, Management Development Officer, T1 Raleigh (Services) Limited, 177 Lenton Boulevard, Nottingham NG7 2DD; for an application form or telephone Mr. M. Fisher, Systems Manager, on 0602 787761 ext. 115 for further information.



**JBA**

## Sales Consultants

Essex/Birmingham c. £13K + car

A leading, nationwide bureau organisation, are seeking experienced Sales Executives to contribute significantly to current expansion plans and develop their own customer base. You will be responsible for selling the bureau's wide range of data processing services, including application packages, terminal enquiry facilities and bespoke systems. Main preferred qualities sought, are a sound understanding of business problems, a proven sales record in a related field, and ideally, a background in accountancy or business systems. Targets are very realistic, and achievable, for salesmen with energy, initiative and the enthusiasm to succeed.

Contact: Brian Postles

## Systems Manager — Designate

Kent and O/Seas c. £13,000

A small but expanding telecommunications systems house require a highly competent technician to take full responsibility for a Command and Control real-time project, with the client site being in North Africa. You will be working on Data General hardware, with the programming language being Fortran, and your main involvement is developing, installing, commissioning and supporting the total system. Experience in systems, comms, and applications software, are essential qualities. Candidates must be prepared to travel overseas though not for extensive periods.

Contact: Janet Chilvers

## Communications Support

London £10,000

The Computer Services Department of this well known organisation, are seeking senior/junior technical expertise in the communications field. It is essential to have good experience of IBM 3270, SDLC, HDLC, X25 or Package switching. For the more senior position, a background including communication system design is of utmost importance. A degree or equivalent qualification in Engineering or related subjects is mandatory for both positions. Good prospects and training will be offered.

Contact: Janet Chilvers

## Systems Software

South Coast £10,000

An internationally recognised electronics company, is at present seeking systems software experience. It is essential to have at least four years in Software development, with knowledge of support tools, such as compilers, linkers and pre-processors, with a particular emphasis on the UNIX operating system. They also require experienced people in the area of real-time systems with micro processors, including peripheral handlers. Knowledge of word processing applications design would be a definite advantage.

Contact: Janet Chilvers

## Analyst/Programmer

West End c. £10,000

Due to continued expansion, a leading film production and distribution company have upgraded their site to an NCR 8430 and so need an experienced Analyst/Programmer to develop certain commercial applications both here and abroad. Applicants should have at least 4 years experience in COBOL and possess the analytical skills required for a dynamic commercial industry. Current systems are mainly interactive, so a knowledge of this technology would be beneficial.

The successful candidate will be required to contribute to development at the Paris office and so a working knowledge of French would be an obvious advantage. Normal large company benefits apply.

Contact: David Hendry

## Mini Systems Analyst/Programmers

London to £8,500

Our client, **Seicon Consultancy International** requires Analyst/Programmers to join its **ENERGY SYSTEMS** division, helping to design and develop systems to manage the exploration, supply and use of Energy resources. Applicants must be self-motivated and should have at least 18 months experience of high-level programming (e.g. COBOL, FORTRAN, PASCAL) on mini-computers. On-line, database expertise would be an advantage. Successful candidates can expect to work on a variety of challenging projects in a demanding environment, the prospect of rapid promotion to project leading and consultancy roles.

Contact: Margaret Stevens

## Analyst/Programmer

London c. £8,500

A well established software house and systems consultancy, are expanding their London office and so have a requirement for analyst/programmers to develop and support turnkey projects based on the TI990 range of computers. Candidates must have at least 3 yrs. experience in d.p., preferably being gained in a mini environment, coupled with a sound knowledge of COBOL. An understanding of not a working knowledge of systems in a financial area, would be an added advantage. Training in the company's products will be given. It is expected that the candidate be self-motivated as this is a responsible position.

Contact: David Hendry

## Programmers — Financial Systems

Rural Hampshire to £7,500 + Mortg. Subsidy etc.

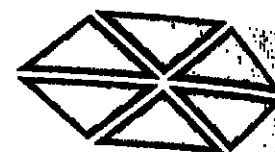
A large and expanding insurance company are currently seeking experienced COBOL programmers to strengthen their project teams involved in development of sophisticated financial systems. Current configuration includes, Red Lion mini and Burroughs B6800 mainframe, incorporating batch systems and on-line testing facilities. Experience must include 18 months COBOL, not necessarily in a financial institution. An excellent training programme has been devised to assist career progression. Absolutely first class package to include mortgage subsidy, low interest loans, sports and social club, generous relocation expenses, plus others.

Contact: Brian Postles

**JAMES BAKER ASSOCIATES,**  
International Personnel Consultants,  
32 Savile Row, London W1.  
Tel: 01-439 9311.

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# HEXAGON CAREER OPPORTUNITIES

## SENIOR PROGRAMMERS

Victoria c. £9,000

- ★ To become involved in 'State of the Art' development using fully conversational IMS DB/DC
- ★ 2 years plus experience in COBOL with some CICS/DLI or IMS
- ★ A first-class Multinational Company with excellent working environment, benefits and prospects
- ★ Candidates with some Supervisory experience will be shown preference

Ref: PJ 80188

## ANALYST PROGRAMMER

West End c. £10,500

- ★ Assist in setting up new DP Department
- ★ IBM Experience required, preferably with APL/VM/CMS
- ★ Large Information System to be installed using RT Interactive TP
- ★ Very good Career Progression into Project Management

Ref: PJ 80178

## MVS SYSTEMS PROGRAMMING MANAGER

Middx/Croydon To c. £14K  
★ Mature Systems Programmer  
★ Experience of MVS/VTAM/NCP, etc.  
★ Two positions with well-respected Multinational Companies

Ref: PJ 81263

## ANALYST PROGRAMMERS & PROGS. HP 3000

Herts and City c. Maximum £10½K  
★ Developing Systems using HP3000/IMAGE/VIEW/QUERY  
★ Requirements for BASIC & COBOL  
★ Two requirements for SPL (will consider ICL PLAN)

Ref: PJ 81264

## ANALYST PROGRAMMERS & PROGS.

Middx To c. £9K + Car  
★ Minimum 2½ years COBOL (pref. IBM)  
★ Hopefully some Supervisory Experience  
★ To work on development

Ref: PJ 81265

## PROJECT LEADER/MANAGER

North London To c. £11½K  
★ To work on the development of a large Inventory Control System  
★ Implementation in various Overseas Countries  
★ Some exposure to on-line systems

Ref: PJ 81266

## ANALYSTS & PROGRAMMERS IBM G.S.D.

Central London To c. £10K  
★ Solid RPGII experience and previous systems involvement  
★ Banking and Financial Applications preferred  
★ Rapid promotion and progression  
★ Some opportunities for overseas travel

Ref: PJ 81267

## ANALYSTS

Central London To c. £10½K  
★ Must have programming background (prof. ICL)  
★ Financial/on-line/communications Applications  
★ Good career prospects

Ref: PJ 81268

## TRAIN AS SYSTEMS PROGRAMMER

Insurance - C. London NEG.  
★ 2/3 years COBOL programming - UNIVAC exp. preferred  
★ To be trained in 'State-of-the-art' systems programming  
★ Excellent Co. benefits - Inc. free life assurance/subsidised mortgage

Ref: PJ 81269

## CHIEF PROGRAMMER

Central London To £12K  
★ 6/7 years COBOL programming - UNIVAC exp. preferred  
★ Large involvement in Database applications  
★ High degree of responsibility  
★ Excellent benefits as expected of major company

Ref: PJ 81270

## PROJECT LEADERS

TEAM LEADERS To c. £14K  
ANALYST/PROGRAMMERS To c. £13½K  
Central London To c. £12K  
★ Major Development Plans  
★ Preferably PL/1 Financial background although good quality is the Prime Consideration

Ref: PJ 80218

## REAL TIME SYSTEMS PROFESSIONALS

London & USA Pounds Unlimited  
★ To develop Communications System & Operating Systems  
★ Preferably experience of PDPs or Micros  
★ Excellent Company, Perks and Prospects

Ref: PJ 80208

## Senior Operator/ D.P. Manager Designate

Brantford International Limited, part of the Furness Withy Group, is one of the largest Freight Forwarding Operators in the U.K. and is expanding internationally.

The Company is introducing a new Hardware Installation at their Head Office at Barking, Essex based on the ICL ME 29 generation of equipment and is seeking a Senior Operator/DP Manager Designate to assist at the commencement of a new phase in the Company's operations. The successful candidate, probably 30 years plus, will have at least 12 months experience on ICL 2903/04 or similar equipment and will have proven supervisory experience. He/she will be expected to become totally involved in Systems Applications, in addition to the efficient day to day provision of batch/real time facilities, the selection and training of operational staff and liaising on the development and installation of peripheral equipment when desired.

Future prospects for the right applicant are extremely good and the importance of this position within the Company will be reflected in the salary and benefits offered. Please telephone or write for an application form to Mr. R. Martin, Personnel Manager, Brantford International Limited, Regal House, East Street, Barking, Essex, IG11 8EY. Tel: 01-594 7181 ext. 367.



(4534)

## CREASEYS

## MICROCOMPUTER SALESPERSON

We are looking for a Salesperson who has computer or systems experience to sell the latest range of Texas Instruments microcomputers.

We are a well-established office equipment company committed to the growth of this new and exciting industry.

A good basic salary plus commission (guaranteed during training), company car and expenses.

Write or telephone for an application form to Mr. P. Millard - Creaseys of Hertford, Castlemead, Hertford SG14 1LH. Telephone: Hertford 54849.



(4414)

## DIRECTOR OF ELECTRONICS AND OF THE MICROELECTRONICS LABORATORY

There will be a vacancy for this post in September 1981, following the appointment of the present Director, Mr. J. A. Coll, to a Senior Executive post in industry.

The Director is responsible for teaching basic Electronics, for more advanced project work in Electronics, and for the further development of Computing and Electronics systems.

In addition to laboratory space for elementary and advanced Electronics, the Microelectronics Laboratory contains:

a. Twelve computers connected by an advanced, high-speed loop. Through this system all boys may learn basic computing.

b. A wide range of computer and associated equipment for advanced project work.

The School has its own salary scale, which extends somewhat beyond Burnham Scale IV. In addition there are supplementary pension benefits, and also housing and children's education benefits.

The School is committed to keeping up with advances in this important and rapidly changing field, and is seeking to appoint a Director who will maintain the present high level of achievement in it.

Applications, including the names of two referees to the Headmaster by 6th March 1981.

QUINDLE SCHOOL  
QUINDLE, PETERBOROUGH PE8 4EN

# The best place in Britain for a computer expert.

Here's your chance to be part of one of Britain's most important energy projects. You will enjoy a competitive salary, an excellent benefits package and good career prospects.

## COMPUTER USER LIAISON OFFICER

We need a Computer User Liaison Officer to work in the Central Computer Services Section, at the Cheshire headquarters of our Northern Division. The work involves assisting staff from the whole of the Northern Division and BNFL who use the dual ICL 2982 computer at Risley. Remote batch and interactive terminals are used for a wide range of scientific, engineering, commercial and managerial applications. The successful applicant will help staff who have problems in the use of the computer, advise users about the facilities available, recommend improvements to the operational procedures and facilities and provide occasional training courses for new and existing users.

WHAT YOU NEED  
An Honours Degree in a

scientific or engineering subject or corporate membership of a senior professional institution.

In addition, several years' experience as a user of a large computer system or of providing and supporting a service on such a system is necessary, as well as an understanding of system control languages and high level languages including FORTRAN and COBOL. Experience on an ICL 2900 system using VME/B would be an advantage.

## THE REWARDS

Appointments will be either as a Professional and Technology Officer Grade 1 with a salary of between £9,205 and £10,915 or as a Senior Scientific Officer with a salary of between £8,180 and £10,295. Conditions of employment are excellent and include an attractive

contributory superannuation scheme.

## THE PLACE

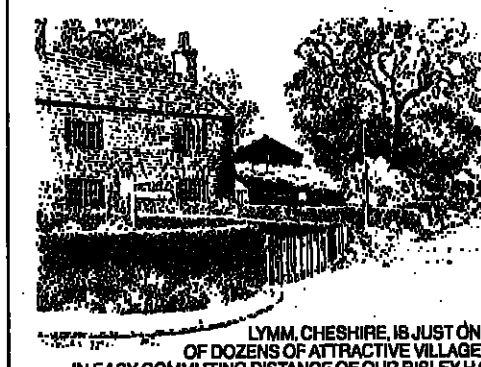
At our Risley, Cheshire, headquarters, we are developing the next generation of commercial power reactors.

Risley, Cheshire is within easy commuting distance of both Manchester and Merseyside, and is well served by motorways.

There's a wide variety of attractive housing all around, much of it relatively inexpensive by national standards. And the area boasts some of the country's best schools in both private and public sectors.

Closing date for completed application forms: 13th March 1981.

SEND THIS COUPON NOW. NO STAMP NEEDED.



LYNN, CHESHIRE IS JUST ONE OF DOZENS OF ATTRACTIVE VILLAGES IN EASY COMMUTING DISTANCE OF OUR RISLEY H.Q.

Please send me an application form for the post of Computer User Liaison Officer. S2344/CW

Name \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

Mail this coupon to The Staff Officer, UK Atomic Energy Authority, Northern Division, FREEPOST, Risley, Warrington WA3 6AT.

UK ATOMIC ENERGY AUTHORITY

(4484)

## SALES EXECUTIVES

### FOR ADVANCED COLOUR GRAPHICS SYSTEMS

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A suitably qualified programmer is required to join a small team at present involved in commissioning the software for the real time plant control data processing system at Dungeness 'B' Nuclear Power Station.

Initially work will centre on assembler programming for the main Ferranti Argus 500 computers, but the successful candidate will also be expected to participate in testing, documentation and library maintenance etc.

Subsequently the duties may be extended to take in the PDP-11 and LSI-11 computers which are becoming more widely used on site. Familiarity with these processors, particularly under RSX-11, would be an advantage. Some knowledge of high level languages would also be beneficial.

Salary within a range: £6171 - £9211 per annum.

Applications granting urgency No. 2341 and giving full details should be forwarded to:

The Station Manager

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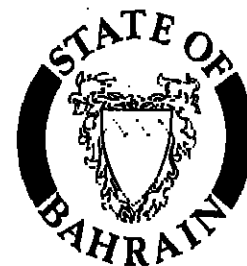
The following are a selection of our current Contract Assignments. However, we have a continuous requirement for skilled and dedicated Contract Professionals, so please make sure you are on our register.

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IBM ASSEMBLER	Programmer/Analyst	USA
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(1440)



## DATA PROCESSING PROFESSIONALS

Applications are invited from suitably qualified candidates for the following positions with the Department of Computing, Directorate of Statistics.

### Systems Development Head £11,305 - £15,485p.a.

Required to co-ordinate activities within the Systems and Programming Section (approx. 25 personnel) whilst reporting directly to the Head of Computing. Applicants should be capable of liaising with Government user Ministries and local and overseas software houses. A knowledge of distributed DP systems and on-line networks is essential.

### Senior Systems Consultant £11,305 - £15,485p.a.

Applicants, preferably graduates with at least 7 years' experience in a variety of DP systems and disciplines, should be familiar with modern data processing managerial techniques and principals and be capable of sales management.

### Project Leaders £9,290 - £13,140p.a.

Applicants should be highly experienced in project leadership in addition to at least 6 years systems and programming experience with a relevant computing science qualification.

Successful applicants will be responsible for all aspects of new projects, initiation, development, implementation and review. The ability to plan and cost such projects is essential.

### Systems Analysts £7,300 - £10,300p.a.

With a minimum of 5 years computing systems experience at least 2 years of which must have been in IBM ANS COBOL programming and 3 in either data processing, systems design, project leadership, training or consultancy.

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## MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611  
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Canadian Pacific Steamships is part of a multi-million dollar international group. As market leaders in its field it is now planning an advanced information system strategy to support future growth.

The recently installed computer will form the centre for a European and North American network system. Development areas will cover all aspects of the company's business and will incorporate the latest computer technology.

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The technical support group is being formed to support the growth of the international information system facility.

As part of that group, the Technical Planner will design and support a rolling three year plan for growth covering both hardware and software needs. This blueprint will encompass relational data-base, telecommunication, word/text processing, message switching etc.

International experience of any of the above areas coupled with strong planning and communications ability will lead to interesting career prospects.

## Data Communications Specialist to £12K

As the centre for the Canadian Pacific Steamships network the I.S. department in London must be able to provide first-class support.

The development of sophisticated national and international networking systems requires a high level of technical excellence.

The data communications specialist will be in control of all aspects of telecommunications for the network. This will include support of both the hardware and software necessary to maintain successful on-line communications facilities. Identifiable achievement in the field of international data communications would guarantee an immediate interview and highlight clear opportunities for advancement.

## Business Systems Analyst to £10K

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MANAGEMENT & EXECUTIVE SELECTION

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The successful candidate, who will already have gained sales experience on mini and microcomputers, and have a knowledge of hardware and software aspects of the business, will be responsible for the UK sales operation of the Zilog General Systems.

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**Training Manager**  
After an initial training period in the USA and Europe, you will be responsible for the co-ordination, development and running of customer training programmes for all Zilog's products.

### Product Marketing / Applications Engineer

This position requires someone with good technical background in microprocessors plus a desire to work in a product marketing environment. You will be responsible for supporting the European sales organisation by providing technical and

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### Commercial Systems Product Marketing Engineer

Using your background in software development or microcomputer sales technical support, you will liaise with regional sales personnel on technical and marketing matters and provide all aspects of support as and when necessary.

### Service Manager

Using your experience in servicing small computer systems, you will liaise with Zilog's microcomputer maintenance organisation within the UK. After initial training in the USA, you will co-ordinate all aspects of Zilog's Northern Europe maintenance activities.

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**SYSTEMS PROGRAMMER** urgently required by our client to provide on-going support and to develop new systems. Hardware here is an IBM 4341 running under DOS/VSE and CICS/VS. Knowledge of French useful — but not essential. Location: France.

**INFORMATION ANALYST** required to work as an adviser on bureau clients' requirements, and to specify solutions that could be applied. This covers such areas as Administration, Finance, Book-keeping, Stock, Production Control etc. This position is permanent and based in South Netherlands.

**SYSTEMS ANALYSTS** with relevant background experience may well be suitable.

**TECHNICAL WRITER** with experience of computer-aided test activities related to Hardware/Software package circuit boards. The work will involve writing user manuals detailing the testing of circuit boards by matrix methods. Location: South Netherlands.

**2 SYSTEMS PROGRAMMERS** familiar with UNIVAC BS9 and/or BURROUGHS B6000 Series. Must be capable of writing systems interfaces and giving hardware advice. Will be working in a research and development group. Location: East Netherlands.

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Ideally we want to hear from people with at least 2 years systems analysis experience, a sound knowledge of on-line and database systems would be an advantage.

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We also have superb sports and social facilities and provide generous relocation assistance where necessary.

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If you have DEC equipment experience or have worked for two years or more on other minicomputer systems, then this company will interest you!

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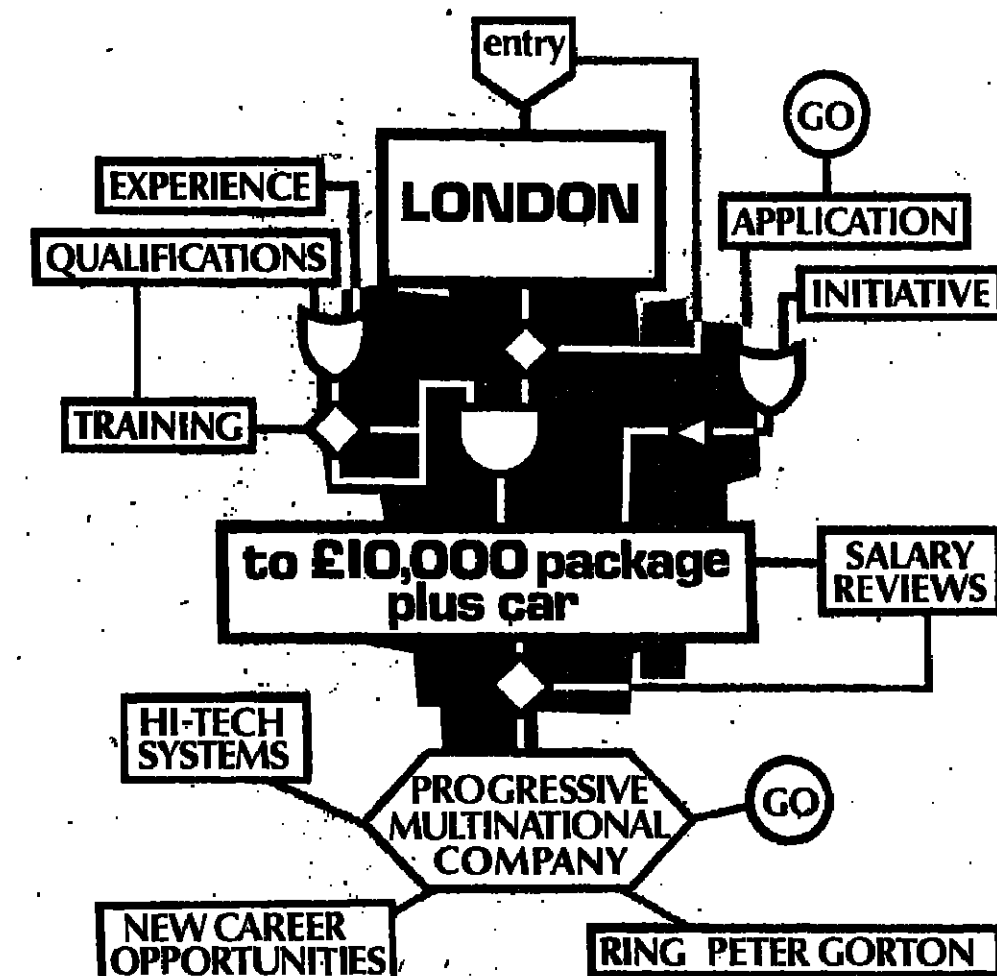
An environment where rapid career progression is possible.

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To qualify for an interview you must have DEC hardware or other mini computer experience, a desire to progress yourself, and a positive attitude.

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Department of Human  
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A student who is required to perform administrative and clerical duties in the Department of Human Nutrition. The work is part of a research project on the growth of children in London. The student will be responsible for data entry, clerical duties, and general office work. The position is for a period of 12 months, starting in September 1981.

The duties will involve conducting and supervising the day-to-day work of the survey, including the collection, processing, and analysis of data. The student will also be responsible for the maintenance of the survey records and for the preparation of reports. The position is for a period of 12 months, starting in September 1981.

For further information, please contact the Director of the Department of Human Nutrition, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT.

**D.P. PROFESSIONAL**

to the Department of Human Nutrition, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT.

The duties will involve conducting and supervising the day-to-day work of the survey, including the collection, processing, and analysis of data. The student will also be responsible for the maintenance of the survey records and for the preparation of reports. The position is for a period of 12 months, starting in September 1981.

For further information, please contact the Director of the Department of Human Nutrition, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT.

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For further information, please contact the Director of the Department of Human Nutrition, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT.

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Come to the States and work with world leaders in Banking, in the Oil Industry, in Finance. We have 370 orientation training for non-IBM candidates, and other training opportunities for all technical staff.

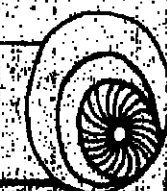
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# MANAGEMENT & EXECUTIVE SELECTION

COMPUTER WEEKLY, February 19, 1981 45

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The benefits are great, the prospects even better. Please contact Diane Oubridge on 01-637 9611.

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Our client recognises that frontrunners cannot afford to stand still and neither can you. Contact Diane Oubridge on 01-637 9611.

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MANAGEMENT & EXECUTIVE SELECTION

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Saudi Arabian Gulf. Salary from £14.75k up to £21k net.

The exploration and development of further energy sources is still of paramount importance even to the world's largest oil producer. To this end their multi-million dollar investment will create one of the most advanced scientific centres in the world. Obviously computerisation will play a major part, and their computer centre based on the Arabian Gulf will incorporate IBM's 3033AP and 370/168 processors, and other current technology peripherals. They will operate with MVS/JES3, SNA/NCP, NJE, TSO, PL/1, MARK IV. The candidates to be recruited will be accommodated in large residential communities which are entirely company operated, and will be at the forefront of this massive expansion programme. For all positions exposure to large IBM systems (preferably 3033's) is essential and the ideal candidates will have between 3-10 years experience in one of the following areas:

### Shift Leader/Console Operators

Shift Leaders/Console Operators with at least 4 years experience of large IBM mainframes. You must have worked on 3033's and 370/168's using MVS/JES 2 or 3, TSO and other software facilities associated with a TP network and Database environment.

### Shift Managers

Shift Managers with at least 6 years experience of large IBM mainframes and at least 2 years experience of managing shift teams of up to 8 people. You will be responsible for all aspects of production from the computers and must be able to diagnose and progress any operational problems to a speedy and effective conclusion. Liaison with hardware engineers and support staff will be of the utmost importance and TP Network experience is essential.

### Technical Support/Operations Analysts

Technical Support/Operations Analysts with a minimum of 4 years experience in operations support for a large OS/MVS environment. You will be expected to resolve all software and network challenges as well as normal software maintenance to keep the configuration running as efficiently and effectively as possible.

### Software Programmers

Software Programmers with at least 3 years MVS experience incorporating either IMS DB/DC or teleprocessing systems.

The successful applicants should have a sound educational background and will be offered indefinite term contracts, initially on single status and can expect generous holidays, free medical treatment, subsidised accommodation and repatriation flights as part of a package that must compare with the best in the Middle East. Company interviews will be held in London in the first week of March, so contact Keith Rowland now on 01-836 8411 (reversing charges) for further information.

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The person required will probably have a minimum of 3 years' programming experience using ANSI 74 COBOL; preferably gained on Honeywell mainframe equipment.

Knowledge of the GCOS operating system is also desirable but not essential.

Applicants should be under 35 with an outgoing personality allied to an ability to mix at all levels in a growing organisation.

Applications, which will be treated in the strictest confidence, should be sent to:

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## INTERNATIONAL SOFTWARE ANALYST

Must be experienced in assembler language and mini or micro systems. A knowledge of European telephone systems is desirable. Join a development team in the US for 6 to 8 months then return to London where you will provide product support to our marketing staff and technical liaison with the US team. Position directly involves the design of new micro-based products aimed at telephone cost management systems. Excellent salary, rapidly growing US company and outstanding job challenge.

Please send CV to: Sykes Datatronics Limited  
Regal House, London Road  
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For International Distributor Network

US manufacturer of floppy disc systems with UK headquarters needs experienced Marketing/Sales Manager - background in mini/computers, peripherals or communications equipment. Applicant needs 3/5 years' sales management background, some outside UK if possible, European language a plus. He will take charge of 10/12 distributors to support marketing, increase sales and coordinate their efforts. Applicant needs good technical background to enable him to support distributors. Some initial training in USA and UK, extensive travel, US company, good basic salary plus incentive bonus based on performance each year.

Please send CV to: Sykes Datatronics Limited  
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Twickenham, Middlesex  
Telephone: 01-891 4796

July 1981



## CAD/CAR TECHNICAL SALES SUPPORT ENGINEER

C. £12,000 p.a.  
Must have knowledge and 'hands on'  
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Kongsberg, one of Norway's leading and most successful engineering companies, is expanding further into the Computer Aided Design and Manufacture systems with its COM 300 CAD/CAM system based upon the AD 2000 software.

The CAD/CAM Technical Sales Support engineer will be responsible to the UK Sales Manager and will be involved in PRE/POST Sales Support.

This will include: Demonstrations  
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Maldenhead (0628) 20207  
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## RS COMPONENTS LIMITED COBOL PROGRAMMER

required by Britain's biggest electronic components distributor, to join a small team working on a Univac 90/30.

Applicants must have at least 1-2 years' experience in Cobol. Knowledge of accounting systems and OS/3 an advantage.

Salary £8,200-£7,200 p.a., depending on experience.

Attractive company benefits include a contributory Pension Scheme and membership of P.P.P.

Please send full career details to:-

Personnel Department  
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37-45 City Road, London, E.C.1

or telephone 01-263 1222 for an application form.

No agencies. (4614)

## IBM Systems Engineers

W. Germany: Salary to £20K

On behalf of an internationally renowned supplier of DBMS and T.P. Software Products we are seeking several IBM oriented Systems Engineers with extensive knowledge of some of the following products and operating systems: CICS, IMS, MVS, TSO, ENVIRON, TOTAL, IDMS or SHADOW. Technically, you must demonstrate 5 years' continuous exposure to the implementation and/or

Support of Data-Base and Teleprocessing Systems in a large or multi-user IBM or Am-dahl installation. The Company is offering superb permanent career positions in its new German office and offers higher than average salaries (even by Continental standards). There is a strong preference for those with a working knowledge of German. Ref. L/7/A

## Business Consultants

Central London: Salary to £14K

Your past experience in the Data Processing Industry has probably given you the ability to identify and solve problems from both a business and technical point-of-view. If you also have good personal communication skills and a strong desire to join a successful and prestigious Management Consultancy, then our client, based in Central London will be very

interested to hear from you. Particular requirements are for graduates aged 28 to 34, who can demonstrate extensive practical experience in the areas of Office Automation, Word Processing and Communications Networks. Respondents with specialist expertise in PRESTEL and VIDEOTEX applications are especially welcome to apply. Ref. L/7/B

## Real-Time Applications

German Speaking: Salary to DM 70K

Consultants, Project Leaders and Programmers are urgently required by a leading U.K. Systems House with a substantial overseas presence. Established project teams in W. Germany are currently developing mini and micro-computer based real-time software for a wide variety of clients. Applicants must have at least two years' experience of Assembler,

Pascal or Algol gained in a real-time environment. Specialist expertise in the fields of Communications Networks, Message Switching or Process Control will be of particular interest. As a degree of customer liaison is required the ability to converse in German is essential although total fluency is not expected. Ref. L/7/C

## Database Analysts/Designers

London & Berkshire: Salary to £13K

Our clients are seeking Database Analysts and Designers for their West End and Thames Valley offices. Applications areas will include manufacturing, production and materials control, scheduling and trend forecasting, budgetary control and cost analysis. Candidates must offer design experience in an installation which currently uses

one or more of: IMS, TSO, DL/I, TOTAL, MVS, MAPICS, or MRPS. A feature of these positions is the extensive degree of client contact in the form of seminars, product demonstrations, feasibility studies and management reporting. The Company offers an extensive and worthwhile range of ancillary benefits. Ref. L/7/D

## Process Control Programmers

London & H. Counties: Salary to £10K

A leading supplier of Industrial and Process Control Hardware and Systems Software is seeking to recruit Applications Programmers and Support Analysts for its U.K. Headquarters. It is obligatory for all applicants to have at least one year's experience in either Assembler or FORTRAN and those who have also had exposure to PASCAL, BASIC or

COBOL will be of particular interest to our client. You will play a significant role in all stages of software and systems development from product planning to installation and live running. Since travel both nationally and internationally will form a significant part of the job function, mobility is an essential criterion for these positions. Ref. L/7/E

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063



Telex: 28800

4527

## The Polytechnic of North London

### POSTS IN MICROCOMPUTING PROGRAMMER

The Polytechnic is in the process of implementing interactive microcomputer based systems over a wide range of college administration including: Finance, Personnel, and the Finance Office and decentralised administration. A Programmer with initiative is required to join the small Management Information Systems team to complete the implementation of existing programs, set up these as a multiuser system and subsequently develop other areas. Most programs have been written in C Basic. Experience in this particular language is not essential but experience of high level language programming is required.

### TEMPORARY PROGRAMMER/ RESEARCH FELLOW

A graduate is required until the end of September 1981 to help complete research project involving the development and programming of a fast build micro computer based system for handling student records. Some high level language programming, not necessarily gained on microcomputer, is essential.

### TECHNICAL SUPPORT

The Polytechnic Computing Service operates a Microcomputing Centre for teaching and research, containing a wide range of computers, e.g. Nascom, Pet, Apple, RV 3802, Vector Graphics, and with facilities for colour graphics, digitising and plotting. Planned development jobs in equipment maintenance, advisory services to users, and equipment software. A Technician Grade 3 post is now available, for which the qualifications are ONC or OND or 2 'A' levels or Ordinary City and Guilds or equivalent. At least three years' experience (including training or equivalent) with some programming experience preferably in the microcomputer field.

The Polytechnic's large DEC 10 will play an important back-up role in all these posts there will be opportunities to gain experience of building micro to mainframes at systems design and programming level. Salaries are on the following scales (which include London Weighting, starting point will depend on qualifications and experience):  
Technician (Grade 3) £5,322-65,000  
Programmer £4,377-65,010  
Research Fellow (Temporary Post) £6,252-65,524

Further details and applications form (please state post is which interested) from Head of Computing Services, The Polytechnic of North London, Holloway Road, London N7 8DB. Telephone 0-800 2789 ext. 2295.

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The Computer Centre provides a service to a wide range of students, academic and administrative staff, providing scientific, non-numeric, commercial and systems support. A large dual Prime 500 interactive system supports upwards of 70 terminals. There is a vacancy for a post of:

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THE POLYTECHNIC  
Wolverhampton WV1 1BB  
Tel. (0902) 710884 (24-hr. answering machine)

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Location: Near Fulham Broadway at our new purpose-built Computer Centre.

Further details: Please phone Barry Baker on 01-736 3344 ext 250 at any time during office hours, or write with full details of age, qualifications and experience, quoting ref BP/78401/GV, to the Senior Personnel Officer, British Gas, 97 Bryanston Street, London W1A 2AZ.

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Ref 08/08

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UNIVERSITY COLLEGE  
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Applicants should be graduates with thorough knowledge of hardware and/or software aspects of microprocessors, together with an ability to communicate with non-specialists. The appointment will be for five years from the date of commencement and will be on the scale OR 1A (£500-£600) or 1B (£470-£500). Duties to commence as soon as possible.

Applications (2 copies), together with the names and addresses of two referees, should be forwarded to the Vice-Principal (Administration) and Registrar, University College, P.O. Box 78, Cardiff, CF1 1XL, from whom further particulars may be obtained. Closing date: March 7, 1981. Reference 2177. (4482)

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MANAGEMENT &  
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**COMPUTER  
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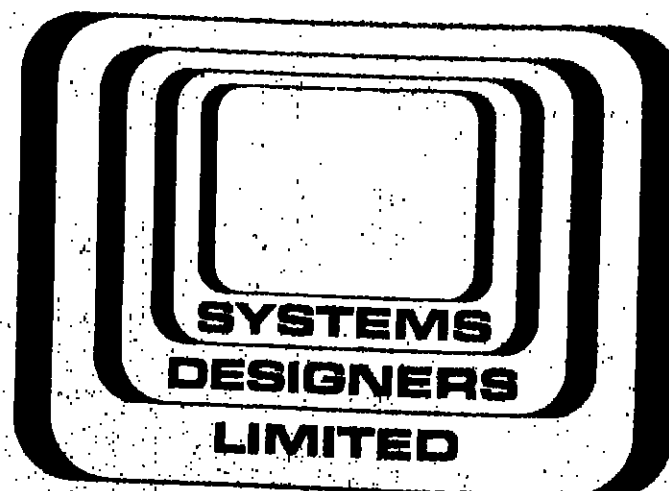
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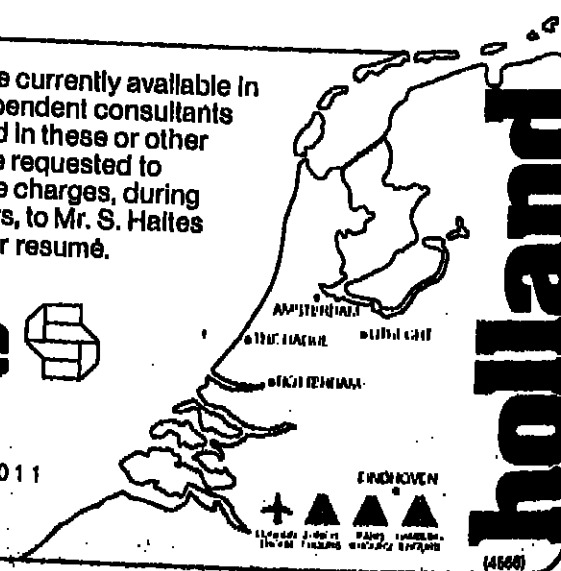
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Brussels 010 322-640 7161/71 Avenue Louise 327, Boite 4, 1050 Bruxelles.  
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Applicants should be able to demonstrate a successful track record in the planning, implementation and management of large scale communications networks and associated business systems, not necessarily in the travel industry, but this would be advantageous. A mature business acumen and the ability to implement decisions of prime importance.

Ten years practical experience in the relevant areas and the ability to organise and direct supporting staff, plus demonstrative negotiating skills with external bodies are considered desirable attributes.

Please apply with comprehensive career details including scope of present responsibilities to:

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The successful applicant for this important position will be joining a well-established hard working Management Team, responsible for precision machining of wind tunnel models and prototype mechanisms.

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An expanding Computer Services Company seeks professional Consultants, Analysts and Programmers to work on the development and implementation of commercial, technical and software applications. Both mainframe and mini backgrounds could be of interest. Ability to accept responsibility and work in a small project team environment is important. Ref: 02/Tim Armistead

### PROJECT TEAM WEST END

£7.5k-£10.5k +

This new team comprising a Senior Analyst Programmer (c. £10.5k), an Analyst Programmer (c. £8.5k) and a Programmer (c. £7.5k) will work on various commercially oriented projects in a manufacturing head office environment. Most of the work will be developed on Honeywell L 8/47 with some use of terminals linked to a Honeywell L 68 mainframe. Benefits include: 5 weeks' holiday, flexible, subsidised meals and contributory pension scheme. COBOL experience is essential. Ref: 03/Ian Murray West

### SYSTEMS ENGINEERS/PROGRAMMERS LONDON/EUROPE

£10,000 + Bonus

Our client, who market and support their own products, are looking for experienced Systems Programmers with a good appreciation of the IBM O/S operating systems software. Ref: 04/Steve Gill

### SENIOR SALES EXEC/ACCOUNT MANAGER LONDON & S. ENGLAND

On quota earnings £25,000

A leading WP/Mini manufacturer requires Salesmen to sell and manage an area. Minimum of 2 years selling word processing or mini based systems in the end user market place is necessary. Ref: 05/Steve Gill

### SALES LONDON & HOME COUNTIES

On quota earnings £20,000+

A leading Company in software products are looking for a Salesman with at least one year's experience in sales or sales support together with an understanding of IBM operating systems. Ref: 06/Steve Gill

### CURRENT CONTRACT VACANCIES INCLUDE:

- MVS Systems Programmers
- Process Control Consultants
- IBM FORTRAN Programmers
- DOS/POWER/COBOL/JCL Programmers
- Univac or IBM COBOL Programmers
- Honeywell Level 68 COBOL Programmers
- IBM 3270 Software Specialists

GERMANY  
GERMANY  
HOLLAND  
GERMANY  
HOLLAND  
HOLLAND  
ITALY

Rates negotiable from £400 per week

Ref: 07/Tim Armistead

For further information, please contact the appropriate Consultant on 01-493 2947 during office hours, or, if more convenient, Tim Armistead on 01-782 5384; Ian Murray West on Milton Keynes (0808) 563415 or Steve Gill on Bedford (0234) 856133 evenings and weekends.

DALROTH & PARTNERS LIMITED, 4 HALF MOON STREET, LONDON W1

## PROGRAMMERS SOUTH WALES SALARY C £6000

Future developments in the data processing requirements of the Company has resulted in a vacancy for an Analyst/Programmer, or Programmer, COBOL is the main language on ICL 2904/60. Experience of T.P.S. and some knowledge of on-line systems desirable.

A relocation package is available to the area, which is close to the major cities of Cardiff, Newport and Swansea.

You should have a minimum of 1 year's experience, salary is negotiable.

There is a contributory pension scheme with life insurance benefits. Apply in writing or telephone (0443-740331) with brief details of yourself to:

Mr. J. Spencer-Davies  
A.B. Electronic Components Ltd.  
Abercromby  
Mountain Ash  
Mid-Glamorgan CF45 4BP



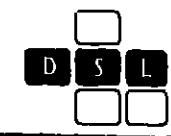
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### DISTRIBUTED SYSTEMS LIMITED

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#### SALESMAN

for London systems house specialising in banking and communications. Experience on DEC equipment desirable. Ref: 81/31. Negotiable basic salary, plus commission (no ceiling), plus car.



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Tel: 01-403 3456 1568 24-Hour Answerphone (4638)

## SMR

Sales & Marketing Recruiters Ltd

Victory House, 30 Bedford Street, London W1B 2HH

## SALES EXECUTIVES

Just in case you think we are merely the industry's leading supplier of career guidance for salesmen (to say nothing of sales training and market research), we are currently recruiting candidates for over 100 selling jobs within more than 30 computer companies.

If you are seeking a career rather than just a selling job, contact Alasdair Scott or Alan Williams — we have the experience to understand your needs.

Tel: 01-734 9776

SALES ENGINEER

for London and the South East

c. £15,000 + Car

## Almarc

### SALES ENGINEER

for London and the South East

c. £15,000 + Car

Almarc Data Systems has gained an enviable reputation as being one of the most progressive and developing companies in the micro computer market. The company has doubled its turnover during the last 12 months and currently envisages sales of more than £1.8m in 1981.

Almarc now require a Sales Engineer who has existing experience of computing and computers, and especially the micro-computer market. He/she will possibly be aged 25-35 years and be fully conversant with selling into a scientific/technical market. There are substantial prospects for development within this fast growing company and the successful candidate will earn in the region of £15,000 during the first year.

Application should be made in writing including all relevant details, marked Private & Confidential to:

David Swain,  
Sales Director,  
Almarc Data Systems,  
906 Woodborough Road,  
Northampton NN3 5QB.

### LECTURER

Applications are invited for the post of Lecturer in Computing Science.

Applicants should have a minimum of 5 years' experience in the field of Computer Science.

Salary Scale 25,000 - 31,175 (inc. O.T.)

Applicants should send their CVs to the Secretary, University of Hull, 68-70, Leazes Road, Leeds LS2 9BT.

Ex. 214 from whom further copies of the advertisement may be obtained.

Two copies of the advertisement may be obtained.

### MICRO COMPUTER PROGRAMMER

Small go-ahead software house specialising in Word Processing Systems have a vacancy for an experienced BASIC programmer. Some commercial experience would be an advantage.

Salary negotiable.

Please contact 25003

Microcomputer Services

25003

## SALES BIT

## Professionalism is a label that has to be earned

I WAS asked recently to give a talk to the employees of a Scandinavian computer company at its annual international convention. It was particularly gratifying that the chosen topic was not some aspect of selling technique or "how to make annual sales quota in the first fortnight", but a more profound and important topic — the importance of being professional.

Everyone wants to be thought of as "professional" if they are really good at their job, no matter what their occupation. The trick is actually getting there.

The dictionary tells us that a professional is one who earns a living by practising an art, sport or non-manual job function. In reality, common understanding of the term implies an overlay of excellence.

Being a professional is not simply a matter of playing a part; it is more the achievement of unquestionable capability, not only in the mechanics of a job, but the way in which it is performed.

Being a sales professional is not a sales technique, an affectation or an endowment of nature; it is a manner of behaviour that transcends the vagaries of selling achievement. There is no training course or formal qualification in professionalism, it is a label that has to be earned.

It is not sufficient for salespeople to appear professional; their professionalism has to be proved over and over again with every customer and at every stage of the sales negotiation, by virtue of actions as well as words. The sale can never be truly closed until this level of empathic understanding and acceptance is established. Let us call it professional credibility.

During the era of Richard Nixon and Watergate, someone coined the expression "I am sure there will be no surprises!"

Usually this consideration is of greater significance to the buyer than the product itself.

Next week I shall write about the principal factors involved in the establishment of professional credibility within the sales situation. I am sure there will be no surprises!

Alan Williams

## COURSES Introduction to robots

Computerised robots is the theme of a four-day course to be held at the Polytechnic of Central London from March 17-20. The course is claimed by organiser ICS to be the first of its kind. It provides an introduction to computerised robot technology and practical techniques for identifying and implementing robot application. Production and technical managers, design and manufacturing engineers, systems analysts and programmers are expected to find the course useful. For further information, contact ICS Publishing (UK), Peblec, Peblec, Tadworth, Surrey, KT20 7PA.

Interest in APL has increased rapidly and Allan D'Morais Associates has designed a series of courses. Two introductory courses are to be held: the first, from March 18-20 and May 13-15, costs £220 + VAT; the second, from March 23-27 and May 8-22, costs £330 + VAT. An advanced APL course will be held from April 1-3 and again from May 27-29, and the fee is £250 + VAT. On March 31 and again on May 26, a one-day seminar, APL Management, will be held. The fee for this is £80 + VAT. All courses take place at ADM's offices in Harrow. For further information contact R. Hummel on 01-863 0621.

A residential workshop on data analysis will be held at the Queen's Hotel, Eastbourne, from March 23-27. Organised by BIS Applied Systems, the course aims to provide delegates with an understanding of new methods in data analysis and logical design, and the skills to define data and its structure within a system or business. The workshop addresses the use of standard methods of analysis and documentation. Fee is £335 + VAT. Details from Jackie Press on 01-261 9237.

APL Management will be held on May 26, a one-day seminar, APL Management, will be held. The fee for this is £80 + VAT. All courses take place at ADM's offices in Harrow. For further information contact R. Hummel on 01-863 0621.

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The Country's most successful Recruitment Service

### Data Processing Manager

Manchester

To £10,000

This manufacturing Company is seeking an experienced Computer Operator. The position of Data Processing Manager provides an excellent opportunity for a young programmer/analyst to take their first step into management. Responsible for operating and maintaining the hardware, you will be involved in the complete software review that is currently underway. A solid programming background in COBOL, practical systems analyst experience and the ability to develop new systems are prime requirements. The position offers total responsibility, full involvement and first-class career experience.

Telephone: 061-832 8631 (24-hour service) quoting Ref. 2243/CW, Reed Executive Selection Limited, 15 Piccadilly, Manchester M1 1LT.

The above vacancy is open to both male and female candidates  
London Birmingham Manchester Leeds

## Computer Service Engineers minicomputer systems

Our client is a significant American manufacturer of minicomputers which incorporate a sophistication of technology which is the envy of the industry. Very rapid expansion of this service orientated company has created an opportunity for experienced customer service engineers to join a highly talented team which provides hardware field service throughout England and Scotland.

The requirement is for self-starters with a minimum of two years experience in providing technical field service to minicomputer installations which include printer and disk devices. The ability to absorb training and the ambition to make a long-term successful career is vital.

Terms include a competitive basic salary, bonus, company car and those benefits associated with a highly successful, forward-looking, international organisation. Location: South/South West England.

Please telephone W. H. Pierce in complete confidence.

**PDL** PETERSON DAVIDSON LTD  
Heron House 19 Marylebone Road  
London NW1 Tel: 01-486 8991

**SENIOR SYSTEMS ANALYST** HERTS To £11,000  
On Line development with Burroughs/DEC Hardware.  
**SYSTEMS PROGRAMMER** BUCKS/HERTS To £10,000  
Knowledge of UNIVAC/IBM with TIPS, CMS/CICS essential.  
**PROJECT MANAGER** BUCKS To £10,000  
Fortran background with HP Hardware.

Phone or write for further details/application form to:

HOWLETT COMPUTER SERVICES  
Ravenstone Chambers, 23 High Street  
Leighton Buzzard, Bedfordshire

Tel. 0525 384735 or 377519, evenings/weekends

**HOWLETT COMPUTER SERVICES**



## WYCOMBE DISTRICT COUNCIL TREASURER'S DEPARTMENT

### COMPUTER MANAGER

GRADE - PO.1 (6-10). SALARY - £9,411-£10,542 P.A.

The district Council is setting up a New Installation based on an I.C.L. ME29 Model 35 machine, to replace an existing 7503 installation working solely under RJE, and gives the Authority an opportunity to continue with the existing RJE link to the Bucks County Council computer whilst up-dating the Data Preparation process and providing for future growth via local processing.

This will include in the first instance the operation of a new system within the Housing Maintenance Section.

The Computer Manager's job will be to oversee initially the transfers from the existing machine to the new machine in September 1981 subsequently for the day-to-day running of the installation, together with systems and programming involvement in the implementation of some package software and the production of a development programme for the future within the Authority.

Responsible to the Computer Manager initially will be a Programmer/Analyst, a Machine Operator and three Data Preparation staff and the Authority is looking for an enthusiastic individual who feels they are able to contribute to the future development of a small computer installation.

The following generous fringe benefits may apply.  
Housing accommodation may be available for married person.  
Casual User car allowance. Assisted car purchase scheme.  
100% removal expenses. £250 disturbance allowance payable.  
Lodging allowance of up to £15 per week for a maximum period of 6 months where appropriate.  
75% Legal and Estate Agent fees paid.

Anyone wishing to have further information concerning the appointment should contact the Deputy Treasurer Bruce Barrell, High Wycombe (0494) 26100, Ext. 222.

Vacancy open to both men and women. Applicants for appointment must enclose a stamped, addressed envelope. Applications welcomed from disabled persons with appropriate qualifications or experience.

Application forms and particulars available from PERSONNEL MANAGER, Council Offices, Queen Victoria Road, High Wycombe, Bucks.  
Tel. High Wycombe (0494) 26100, ext. 264.  
Closing date 11th March 1981.

## NORTH YORKSHIRE COUNTY COUNCIL

### Senior Assistant County Treasurer and Head of Computer Services

£14,286-£15,177 (from 1st April, 1981)

Applicants should be computer enthusiasts with experience of the administration of a major computer installation. With a current staff of 74, the successful applicant will be responsible to the County Treasurer for managing the authority's ICL 2978 and 2970 systems operating under VME/8; providing a comprehensive computer service to all departments of the County Council, several District Councils and other bureau users; and developing advanced computer systems.

Apply, giving full personal details, summary of previous experience and names of two referees, to County Treasurer, County Hall, Northallerton DL7 8AL (Tel. Northallerton (0809) 3123 Extension 406). CLOSING DATE 21ST FEBRUARY, 1981.

HP 3000

£8,000+  
Location: Hants

### COMPUTER MANAGER

Expanding Book Distribution Company, retailing and wholesaling, requires an energetic person to take control of their recently installed Computer Systems and all future developments. He/she will be responsible for a staff of ten.

Using the HP 3000 series 3, the application revolves around Stock Control at several locations and takes in such technology as Lightpens and OCR and a Print. The extension of point of sale units in retail outlets is planned.

The applicant should have HP 3000 operational and COBOL programming experience, and be looking to extend their skills into the general management field.

Apart from pay the benefits include 4 weeks' holiday (5 weeks after two years) and pension scheme.

For an application form please contact:

Mrs. B. Phillips - Personnel Manager  
HAYNICKS BOOKSHOPS LTD  
16 Newmarket Lane, Alton, Hants GU34 2BJ  
Telephone Alton (0420) 85822



## Insight Marketing & Personnel Consultants

# SALES Appointments

**GRAPHICS - MANCHESTER & NORTH - £17K + Car**  
Sales of Graphics systems - top flight manufacturer - new and exceptional opportunity. Salary - £14K.  
Contact: Manchester Office, Ref JVB/9

**MINI COMPUTERS - WEST MIDLANDS - £18.5K**  
Commercial environment - major account management and new business - first class company - with exceptional record. Salary - £8.5K.  
Contact: Manchester Office, Ref JVB/10

**LONDON - W.P. EXECUTIVES - £30K + Car**  
February is the launch date for this revolutionary UK designed and manufactured Word Processing Computer. It boasts a cost/performance ratio to beat the world. Proven Major Account sales executives are sought to address Government, Finance and Blue Chip institutions. £10K base salary.  
Contact: London Office, Ref DS/3

**SURREY - MAJOR ACCOUNTS - £15K**  
Mature, proven individuals are invited to discuss this responsible senior sales opportunity. The company is a worldbeater and the opportunity unique.  
Contact: London Office, Ref DS/2

**SBS & TERMINALS - DUBLIN - £17K + Car**  
Sell for the most successful computer company in Ireland last year.  
Contact: Dublin Office, Ref PR/1

**MEDIA - DUBLIN - £16K + Car**  
Start-up opportunity selling consumables to OEM and users. Salary - £10K - £12K.  
Contact: Dublin Office, Ref DM/2

**COMMERCIAL SYSTEMS - CORK - £8K - £14K**  
Selling into existing user base with second largest computer company in Ireland.  
Contact: Dublin Office, Ref PR/3

**MINIS - BELFAST - £17K + Car**  
Sell a broad range of technical and commercial mini computers. Start-up situation, high guaranteed income.  
Contact: Dublin Office, Ref DM/4

**MICROS - DUBLIN - £17K + Car**  
Selling commercial, technical & OEM. Salary - £10K.  
Contact: Dublin Office, Ref PR/8

**BEDFORD - RETAIL SYSTEMS - £16K + Car**  
A "groundfloor" opportunity to join a new division of an established and stable organisation. P.O.B./retail systems experience an advantage. £8.5K base salary.  
Contact: London Office, Ref DS/1

**OEM - MIDLANDS/EAST ANGLIA - £17.5K + Car**  
World leading multinational company - micro/mini computers and terminals. Salary - £10K.  
Contact: Manchester Office, Ref JVB/1

**R/T MINIS - NW AND YORKS - £15K + Car**  
End-user sales of real time, multiprogramming, computer based systems - Business applications network - wholly owned British Company.  
Contact: Manchester Office, Ref JVB/2

**DATA ENTRY SYSTEMS - NW AND YORKS - £15K + Car**  
Key-Disk data entry systems with applications processing ability - UK Company - large existing user base. Salary - £7.5K.  
Contact: Manchester Office, Ref JVB/3

**BUSINESS COMPUTERS - SCOTLAND - £17K + Car**  
Range of machines from single terminal to 200 terminal configuration - UK Manufacturer. Salary - £7.5K.  
Contact: Manchester Office, Ref JVB/4

**WORD PROCESSING - NORTH WEST - £14K + Car**  
One to multi keyboard - existing large user base - main distributor - exciting position with new company. Salary - £7K.  
Contact: Manchester Office, Ref JVB/5

**CAD/CAM - MIDLANDS & NORTH - £23K + Car**  
Exceptional sales opportunity with Manufacturer of CAD/CAM systems - exceptional growth company. Salary - £9K.  
Contact: Manchester Office, Ref JVB/6

**BUSINESS SYSTEMS - YORK - £16.5K**  
Mini manufacturer - distributed processing systems - sound existing user base. Salary - £8.5K.  
Contact: Manchester Office, Ref JVB/7

**W.P./COMPLEX COMMS NETWORKS - EAST MIDLANDS - £27K + Car**  
Major accounts environment and new business - leading company - top benefits - exceptional prospects. Salary - £11K.  
Contact: Manchester Office, Ref JVB/8

**UK WIDE - MINIS - £16K + Car**  
Experienced computer salesmen are urgently needed by a leading international manufacturer, selling mainly to OEM's. Full training given in USA. Applicants must be ready to start quickly.  
Contact: London Office, Ref JVB/1

**LONDON - TELECOMS - £16K + Car**  
Would you like to sell mini computer systems and IBM terminals for a major British Communications company? Preference given to technical expertise and knowledge of production control. Salary - £9K.  
Contact: London Office, Ref AVP/2

**SURREY - BUSINESS SYSTEMS - £17K + Car**  
A computer person with a good technical background is required for this top-flight position to handle MAJOR ACCOUNTS only. Selling experience is less important than technical ability. This would be your chance to break into selling.  
Contact: London Office, Ref AVP/3

**HOME COUNTIES - MINIS £16K + Car**  
A new company is being formed by two existing organisations to develop the sale of business systems. They are looking for a computer salesman to head up the sales organisation. Experience of mini-computers and commercial systems is essential. Salary - £16K.  
Contact: London Office, Ref AVP/4

**LONDON - MAJOR ACCOUNTS - £16K + Car**  
A major international computer manufacturer needs a computer professional to handle major accounts based in West London. Knowledge of computer applications is essential. Training in the USA.  
Contact: London Office, Ref AVP/5

**FINANCE MET - CITY OF LONDON - £15K + Car**  
Selling to Banks, Stock Brokers, Insurance Orgs. Computer Systems & proven applications. Mainframe manufacturer. Defined market with rewarding opportunity.  
Contact: London Office, Ref ODH/4

**BIRMINGHAM - BUSINESS SYSTEM - £17K + Car**  
Well established manufacturer, excellent products & support. Good user base. Training programme. Must be experienced professional salesman.  
Contact: London Office, Ref ODH/2

**STRATFORD ACTS - CITY OF LONDON - £16K + Car**  
Senior sales International Terminals Co. negotiating multi-million £ orders in financial/banking houses. Base salary - £12K.  
Contact: London Office, Ref ODH/3

**ACCOUNT EXECUTIVE - LONDON - £20K + Car**  
Sales experience in business systems or IBM 3270 replacement systems to Universities, Public Utilities & Commercial. Training in USA. Promotional opportunities.  
Contact: London Office, Ref ODH/4

**MAJOR ACCOUNTS - LONDON - £22K + Car**  
Marketing high volume/low cost electronic monitoring systems, into major business/financial houses. Base salary £12K plus equity participation. Unique opportunity for entrepreneurs.  
Contact: London Office, Ref ODH/5

**COMMS/TERMINALS - SOUTH - £16K + Car**  
Sell distributed systems to household name companies and major IBM users. Other salesmen have earned £20K - £30K p.a.  
Contact: London Office, Ref JFEG/1

**MTG SYSTEMS - LONDON - £18K + £22K**  
3 sales executives required for international systems company to sell manufacturing systems to industry. New division with many qualified prospects and installed base. Salary - £8K to £12K.  
Contact: London Office, Ref JFEG/2

**CAD/CAM - UK & EUROPE - £20K + Car**  
South & Midlands plus European sales opportunities to sell complete CAD/CAM & Graphics systems. Salary - £10K + guarantee.  
Contact: London Office, Ref JFEG/3

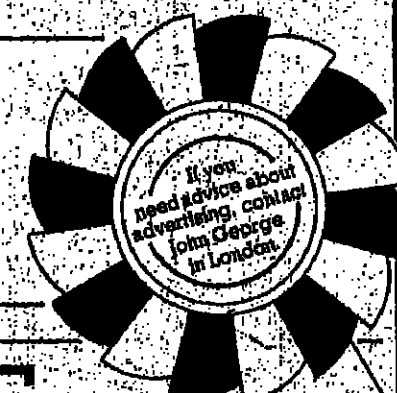
**TERMINALS/PERIPHERALS - NORTH/SOUTH - £16K + Car**  
Selling terminals & communications to large computer users and OEM's Southern & Northern offices.  
Contact: London Office, Ref JFEG/4

**BUREAU SERVICES/MINIS - SOUTH/MIDLANDS - £16K + Car**  
Large service bureau/OEM company needs sales executives for London/Home Counties/Midlands. Salary - £8.5K + benefits.  
Contact: London Office, Ref JFEG/5

**SYSTEMS CONSULTING - LONDON - To £30K + Car**  
Senior Sales Executive to start up new commercial division of international software house. Excellent salary and potential enormous.  
Contact: London Office, Ref JFEG/6

**CITY - HARDWARE - £13K + Car**  
ENGINEERS?? This could be your opportunity to begin a sales career. Ideal candidates will have a knowledge of DEC or other mini computer hardware, and will be good communicators with a real desire to "go-selling". Salary - £7K.  
Contact: London Office, Ref DS/8

**WEST LONDON - SERVICES - £20K + Car**  
The marketplace is the exploding information processing industry. The company, the MARKET LEADER, has enjoyed more than ten years uninterrupted growth. Polished professionals are sought with a sound data processing industry background and ideally, a knowledge of IBM systems. Salary - £8K.  
Contact: London Office, Ref DS/4



## TOP JOBS FOR TOP SALES PEOPLE

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**LONDON**

72-78 Marylebone High Street  
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**MANCHESTER**

Austin House, Charlotte Street  
Phone: 061-236-7026

**DUBLIN**

20 Upper Fitzwilliam Street  
Phone: 0001-806644

## GUIDE TO RECRUITMENT CONSULTANTS IN THE U.K

LONDON & H. COUNTIES (LH). MIDLANDS (M). NORTH (N). SCOTLAND (S). OVERSEAS (O)

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Telephone 01-222 1111  
77 Lf. or phone 01-222 1111  
0000

Ivor Norton Management  
Services Ltd

Recruitment Consulting Division  
87 Shaftesbury Avenue, London W1V 70E  
Tel. 01-222 1111  
P.O. Box 123, 123 Bedford Square, London WC1A 2EJ  
Telephone 01-222 1111

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Telephone 01-222 1111  
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### COMPUTER INDUSTRY SPECIALISTS

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AUSTIN HOUSE, CHARLOTTE STREET, MANCHESTER. TEL. 061-236 7026

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Telephone 01-222 1111  
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THE NORTH OF ENGLAND

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SCOTLANDS SPECIALISTS  
COMPUTER STAFF APPOINTMENTS

Vacancies in U.K. and Overseas  
Alan Daly  
124 St. Vincent Street  
Glasgow G2 5JL  
041-221 4154

FOR FURTHER DETAILS  
OF THIS WEEKLY  
FEATURE CONTACT

OWEN KELLY  
061-972 0001